

The State of the St. Croix Basin

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Photo courtesy of Ken Jonas, WDNR

An integrated resource management plan
developed by the Wisconsin Department
of Natural Resources and Partners



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April 16, 2002

Subject: St. Croix River Basin Plan

Greetings -

The St. Croix Basin spans both Wisconsin and Minnesota. *This State of the St. Croix River Basin Report* describes the status of land and water resources in the Wisconsin portion, which covers 22 watersheds, 4,165 square miles and parts of nine counties. WDNR and Partners have also articulated a shared vision for future ecological health, as well as management goals and priorities for work to maintain, protect and enhance the basin's resources over the next few years.

The St. Croix Basin is a special area of the state. Its abundant streams, lakes and wetlands, rich forests and farmlands, wildlife and fisheries make this a popular recreational destination and location for living. The River begins in Upper St. Croix and Namekagon Lake and drains through diverse ecological landscapes. Starting with the Northwest Lowlands and North Central Forests, and moving through the Northwest Sands and Farm Forest Transition, the Basin ends in the Western Prairie Ecological Landscape. These five *ecological landscapes* present different management challenges and opportunities. Loss of large industrial forest block ownership in the north is a major concern, as are changes in agricultural practices in the western prairie and farm-forest transition landscapes. Agricultural changes include more row crops and a switch from small dairy farming to large confined animal feeding operations which enhance concerns over barnyard runoff, streambank erosion and manure management. Also, St. Croix and Polk Counties face problems associated with rapid growth and development stemming from the St. Paul-Minneapolis Metropolitan Area and struggle to maintain the area's rural and agricultural features.

The Basin is rich in water: groundwater, rivers, streams, lakes and wetlands. Our lakes and rivers are under tremendous development pressure and this will likely increase as the human population continues to grow and settle in this area. Development along lakeshores is one of the state's fastest types of developments, and the basin is no exception. Home building is also occurring along rivers and streams in part due to the dwindling supply of available lakes. Increasing runoff and habitat loss from development degrades water and eliminates or divides contiguous habitat needed by fish and wildlife.

Goals for the St. Croix Basin include maintaining and improving water and air quality; maintaining diverse, rich shoreland habitat; preserving large contiguous blocks of forestland; working with the agricultural community to minimize nonpoint runoff; and working with cities, villages, towns and counties to help stem urban sprawl. This planning document will provide a framework to move forward in our efforts over the next six years.

Sincerely,

Thomas D. Beard, St. Croix Water Basin Leader

Bruce Moss, St. Croix Land Basin Leader

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Executive Summary

The primary purpose of the State of the St. Croix Basin Report is to provide direction to Department staff during preparation of biennial work plans. The report reflects the priorities of our agency, our partners, and the public for the best management and protection of the valuable and abundant natural resources in the Basin. This plan replaced the St. Croix River Basin Water Quality Management Plan developed in 1994. Unlike the Water Quality Plan, the Integrated Plan will convey an ecosystem management approach because it includes both land and water resource issues, specifically focusing in on fish, wildlife and watersheds. The new plan is not intended to be a compendium of every activity that the Department or the partners are doing in the Basin, but rather it focuses on the joint priorities and responses to those priorities.

Basin Description

The St. Croix Basin lies in northwestern Wisconsin and northeastern Minnesota. The Wisconsin portion of the basin consists of 22 watersheds covering an area of 4,165 square miles and portions of nine counties. This water-rich area is sprinkled with an assortment of inland lakes, major rivers and small streams. The topography of the basin is primarily rolling glacial terrain. It ranges from flat outwash plains to knob and kettle end moraines. The glacial drift consists of ground moraine in the southern quarter and parts of the northern quarter of the Basin; end moraines along the northern and northeastern basin divide, with broad belts near the center of the Basin; and pitted outwash in the northern two-thirds of the basin and in the St. Croix and Mississippi River valleys. Recreation, forest industry and agriculture dominate the economy. The Basin's blend of picturesque open land, large blocks of forested land and abundant water combined with seemingly limitless recreational opportunities are increasingly in demand. However, the close proximity of this area to the Twin Cities is putting stress on resources. The challenge for all of us is to satisfy people's needs without destroying the abundant but fragile natural resources that make this area so attractive to so many people.



Resource Concerns

Several techniques were used to determine the priority natural resource concerns in the basin from the perspective of not only Department staff but, more importantly, the public. The Wisconsin St. Croix Basin Partner Group identified 21 priority issues which were consolidated into four key priorities: shoreland (lakes and rivers) habitat protection and restoration; nonpoint source runoff contamination of surface waters; cooperation with grassland/prairie and wetland restoration to protect soil and water quality and enhance wildlife habitat; and the Northwest Sands Integrated Ecosystem Management Plan.

Aquatic Resources

Preservation of ecological diversity is a major issue in the St. Croix Basin since waters here support a large number of rare species. Fish management concerns include development pressures and loss of water and habitat quality; the presence and threat of exotic aquatic species, loss of critical spawning areas, general decline in natural warmwater sport fishery populations, fish stocking effectiveness, funding issues, fishing pressure and regulations, youth participation in fishery activities, need for more monitoring, and resource use conflicts. Water quality issues include nonpoint source pollution, key

contaminant inputs from point and nonpoint source dischargers, loss of rare and endangered aquatic species, aquatic community simplification, and the presence of exotic species.

Threats to the Basin include storm water runoff, agricultural practices and dams. All watersheds are susceptible to polluted runoff and controlling this source is a major workload for staff that will grow in the future. The following key points exemplify the growing water quality concerns in the Basin:

- **Impaired Waters List** - 4 water bodies are listed. Overall, 1.5 miles of streams and 3 lakes are listed
- **Nonpoint Source Watershed Ranking** - 6 (27%) of the 22 watersheds rank high for nonpoint source management; 2 rank medium; 1 ranks low; and 13 are unranked due to insufficient information; over 30 lakes are ranked high due primarily to threats from nonpoint sources
- **Outstanding and Exceptional Resource Waters:** The St. Croix River, Namekagon River and a significant number of streams and lakes are designated outstanding resource waters. (Portions experience tremendous development and/or are receiving nutrients and sediment from tributaries).
- **Existing Nonpoint Source Management Projects:** Ongoing Priority Watershed Projects are: Balsam Branch, Kinnickinnic River, Osceola Creek, Horse Creek, St. Croix Lakes Cluster and Big Wood Lake.
- **Special Management Actions:** Ongoing EQIP Project is Kinnickinnic River

Drinking and Groundwater Resources

Threats to drinking and groundwater are a major concern as most people depend on well water. The dominant issue is the contamination or potential for it from incompatible land uses on thin soils. Other issues include deteriorating wells and the balance between withdrawal and recharge of groundwater.

Terrestrial Resources

Today, many small farmers face the need to expand operations or sell. Changes from small dairy farms to row crops and large confined animal feeding operations are common. Vacant farmland is being converted to suburban and rural development or divided into smaller parcels for private recreation. This change in the landscape has major implications for ecological structure and function. Over the next few years, staff will concentrate on the following areas:

- Management plans will be written through the managed forest law for sound forestry practices on privately owned forest property.
- Grassland habitat will be developed and wetlands will be restored in the western prairie and transitional forest portions of the Basin. Many of these projects are dependent on continuation of state and federal incentive programs.
- With the new smart growth legislation, staff will be devoting time to assist local units of government develop land use plans that recognize the benefits of and protect our water, forest, wetland and farmland.
- Trail and infrastructure improvements to our state parks and forests will enhance the recreational opportunities on those properties. DNR will continue to work on recreational use conflicts.

Future Challenge

The challenge will be to meet demand for access to rivers, lakes and forests while protecting the character of these resources. The Land Legacy Study identifies critical habitats to preserve. However, land acquisition is not and should not be the primary avenue for resource protection. Public awareness of resource conditions, issues and threats, and active involvement in creative solutions to address these issues is the best way to attain sustainable resource management. Through encouraging individual action, public involvement, and strong partnerships, resource quality will be maintained for future generations.

St. Croix Partnership

The Wisconsin St. Croix Basin Partnership represents a spectrum of people and organizations with natural resources interests, concerns, obligations, responsibilities, and/or authorities, including the Department of Natural Resources. These partners cooperate to set mutual priorities and get work done in the Basin.

The Department and partners use the partnership to help set joint and Department priorities for the Basin, defining roles of the agency and the other partners in addressing those priorities. This allows the Department and external partners to focus their collective resources and contributions in a collaborative manner on these mutually identified objectives.

The Wisconsin St. Croix Basin Partner mission is to cooperatively foster protection and enhancement of the ecological values of the St. Croix River Basin and the quality of life for those who live and recreate in the Basin. The Basin Team identified a set of priorities using the expertise of its members and a review of pertinent plans, including local county land and water plans, Northern Initiatives Lakes & Shorelands Plan, DNR and USFW Strategic Plan and a set of other plans developed by agencies in the Basin. The Wisconsin St. Croix Basin Partners developed an initial list of 21 priority issues and later selected the top four issues as partnership priorities.

Partner Team Priority Issues

1. Shoreland (lakes and rivers) habitat protection and restoration.
2. Non-point source run-off contamination of surface waters (agriculture, road building, and building site construction and forest roads/crossings).
3. Cooperation with grassland/prairie and wetland restoration initiatives in order to protect soil and water quality and enhance wildlife habitat.
4. Pine Barrens management.
5. Citizen water quality monitoring on lakes and streams (will provide both water quality information and citizen education).
6. Voluntary conservation incentives (could include tax incentives, conservation easements, and stewardship recognition awards).
7. Protect ground water from contamination.
8. Balancing user experiences with protection of the resources and access issues on public land and waters.
9. Waste water treatment issues.
10. Urban sprawl.
11. Promote sound timber management techniques on private woodlands.
12. Coordinate land information programs between agencies.
13. Encourage towns, cities and villages to adopt comprehensive zoning.
14. Land use conflicts (agriculture and timber vs. encroaching rural residential property).
15. Large scale industrialized farming.
16. Coordinate county land and water plans with the St. Croix Basin Plan.
17. Landowner education at the time of purchase (could include shoreland and zoning issues, conservation easement issues, and timber management issues).
18. Impacts from rural development and loss of farmland.
19. Balancing property rights (public vs. private).
20. Conduct monitoring/inventories to increase information base of lakes and streams.
21. Identification and protection of critical/sensitive lake and stream habitat.

Refined Partnership Key Priorities

Shoreland (lakes and rivers) habitat protection and restoration

With the tremendous development pressures on our lakes and rivers within the basin, the Basin Partners decided to give a very high priority to this issue and put efforts into education, voluntary conservation, technical assistance and acquisition to help protect some of these unique resources. Appendix F contains a listing of Exceptional Resource Waters and Outstanding Resource Waters located in the St. Croix Basin.

Non-point source runoff contamination of surface water

With the continued urban development in the lower St. Croix Basin and the development on our lakes and rivers in the northern part of the basin, the Basin Partners gave a high priority to educating the public on good watershed management practices. This was started through the sponsorship of workshops on phosphorus reduction and prevention in the St. Croix Basin.

Cooperation with grassland/prairie and wetland restoration initiatives to protect water Quality and enhance wildlife habitat

With the continued urban development and land fragmentation that is taking place in the southern part of the basin we are continually struggling to protect wetlands and grassland/prairie habitats. The Basin Partners put a high priority on developing efforts to preserve and enhance these unique land types through education efforts with the public. Many agencies, including the DNR, are focusing on restoring drained wetlands on both public and private lands. Through various programs contained in the current and past federal Farm Bills, agencies are actively restoring grasslands and/or native prairie. Several thousand acres of farmland have been seeded to grassland under the CRP program, and a few thousand acres of this has been planted to native prairie grasses and forbs.

Northwest Sands Integrated Ecosystem Management Plan

The Northwest Sands Area is an ecosystem that stretches across the northern part of the St. Croix Basin into the southern part of the Lake Superior Basin. The globally threatened Pine Barrens community is located within the Northwest Sands. The Basin Partners collaborated with the public and a larger planning team to develop an ecosystem management plan to guide protection and management of this unique area.

The St. Croix: Institutional Setting

The St. Croix Basin's location at the border of Minnesota and Wisconsin and its ecological significance, both for its terrestrial and aquatic resources, have led to multiple management programs developed by a numerous governmental, nonprofit and private interests. The following is a short synopsis of a few programs that focus on the St. Croix Basin's resources.

National Scenic Riverway Designation

The St. Croix National Scenic Riverway, which includes both the Namekagon and St. Croix Rivers, was established in 1968 under the National Wild and Scenic Rivers Act. The portion of the River below St. Croix Falls/Taylors Falls was added in 1972 as The Lower St. Croix National Scenic Riverway. The Riverway consists of the rivers and their riparian lands. The National Scenic Riverway designation resulted in private land acquisition, scenic easement acquisition, water use regulation, and state-mandated but locally implemented zoning to control land use. The riverway is administered by the National Park Service from the headwaters of the St. Croix and Namekagon Rivers, to Stillwater, Minnesota (federal zone), below which it is administered by the Minnesota Department of Natural Resources (MDNR) and Wisconsin Department of Natural Resources (WDNR) (state zone). Other interested parties include the Chequamegon National Forest along the upper Namekagon River, the St. Croix Band of Chippewa on the St. Croix River near the mouth of the Yellow River, and Douglas, Burnett, and Washburn County Forests along the upper St. Croix and Namekagon. Seven state parks, two of which are in Wisconsin, three state forests, one of which is in Wisconsin, and two wildlife refuges also exist along the course of the Riverway. Although much of the riparian land is in federal or state ownership, there is also private land along the Riverway.

Interstate Concerns and Coordination

The federal Scenic Riverway designation has provided the St. Croix and Namekagon Rivers protection from continued riparian development. In the federally administered portion of the Riverway above Stillwater, MN, most of the riparian setting is protected by National Park Service fee ownership or scenic easements. Nearly all of the riparian lands in the 25-mile state-administered zone from Stillwater south are privately owned and under local zoning control based on state riverway standards. In 1998, the National Park Service finalized the Upper St. Croix National Scenic Riverway Final Cooperative Management Plan, or "Master Plan." In 2001, the Lower St. Croix National Scenic Riverway Final Cooperative Management Plan and Environmental Impact Statement were finalized.

In the early 1990's, continued development and usage of the St. Croix River concerned water resource managers about the impact on water quality. Nutrient loading from the tributaries was increasing the rate of eutrophication in Lake St. Croix, a sink in the St. Croix River Basin. Although the St. Croix River was protected as a National Park, this federal agency had no control over the quality of water flowing into the park from tributaries draining into the St. Croix and Namekagon Rivers.

Largely through efforts of the Minnesota-Wisconsin Boundary Area Commission, a cooperative agreement for joint water quality planning on the St. Croix River and Basin was developed and signed in 1993 by the National Park Service, WDNR, MDNR, and the Minnesota Pollution Control Agency (MPCA). The agreement establishes a St. Croix River Basin Team to develop a "basin plan" for the River. The Minnesota Wisconsin Boundary Area Commission facilitated the interstate planning process. A "Plan of Study," which identifies issues and information needs for the interstate water quality management plan,

was developed by the team in 1993. In 2001, the Interstate Basin Team submitted a draft of the St. Croix Basin Water Resource Planning Status Report for review. The Minnesota-Wisconsin Boundary Commission was dissolved in 2001.

The St. Croix Basin Water Resources Planning Team functions as a partnership with the membership contributing coordinated resources and talents to the management of the St. Croix. Scoping sessions with stakeholders identified a list of water quality concerns, around which the Basin Team developed a four-phase approach to address these issues. The Basin Team has secured funding to conduct numerous research activities to acquire data to address water quality concerns. Since 1994 the approximately \$1.4 million that has been directed toward gathering the necessary data can be attributed directly or indirectly to the efforts of the Basin Team.

This basin planning effort is also coordinated with the U.S. Geological Survey (USGS) National Water Quality Assessment (NAWQA) project for the Upper Mississippi River Basin. The NAWQA program focuses on status and trends in surface and groundwater around the United States. The Upper Mississippi River Basin is one of sixty NAWQA study units and includes all of the St. Croix River Basin and portions of the Minnesota and Mississippi River Basins in Minnesota and Wisconsin. The project cycle consists of six years of intensive work, followed by less intensive efforts to monitor long-term trends (Stark, 1993).

Within the Wisconsin DNR's management structure, the St. Croix and Pierce County portion of the St. Croix Basin is managed by Lower Chippewa Basin DNR staff. The Lower St. Croix National Scenic Riverway continues to be an important natural protected corridor for people to use. The riverway maintains a diversity of scenic, natural and cultural resources, while also preserving rural and small town qualities. The riverway's waters accommodate diverse recreational and living experiences ranging from quiet solitude to highly social, motorized experiences. This is an area of minimal conflicts, with riverway users, landowners and managing agencies working together to achieve the agreed upon common vision or goals. The designation of the St. Croix and Namekagon Rivers as a National Scenic Riverway in 1968 under the National Wild and Scenic Rivers Act has resulted in numerous studies and plans are being developed for this waterway. Several of these have been listed as resource references in this plan. Responsibility for administration and management of the largest portion of this resource rests primarily with the Federal Government through the National Park Service. For these reasons, limited discussion on mainstem waters of the St. Croix and Namekagon Rivers are included in this plan.

DNR Priority Issues

In addition to the priority issue identification work conducted with its partnership team, DNR St. Croix Basin management and staff evaluated existing program missions, goals, objectives and tasks. This review resulted in the following list of DNR priority issues.

- . Motorized Recreation Impacts
- . Development Impacts
- . Agricultural Impacts
- . Dam Impacts
- . Exotics
- . Potential loss of endangered/threatened species
- . Animal Damage
- . Overharvest of Fish
- . Feeding of wildlife (concentrations increases disease, etc.)
- . Toxics (copper, mercury, fish contamination)
- . Solid waste – landfills
- . Lack of data/information needed to manage
- . Need to educate the public
- . Lack of staff and funding

Basin Ecology

The St. Croix Basin exhibits significant diversity over its 115-mile length from north to south. The northern area of the basin has much less agriculture than the southern portion due to the less suitable soils and climate and large public lands ownership. A higher percentage of the north is forested with approximately one-third of these forested lands in either public or industrial ownership. This area is experiencing significant change through the growth in seasonal and permanent homes on private forest lands and particularly on lake and river shorelands. With most of the larger lakes near full development, a recent trend has been toward rapid development of smaller lakes (typically 50 acres or less in size) and along the larger river corridors.

The southern portion of the Basin is characterized by highly productive soils and utilized for typical agricultural practices with dairy operations, and production of grains and vegetable crops for the local canning companies operating in this area. This area also has an abundance of shallow prairie pothole lakes and wetlands and smaller forested tracts in private ownership. The southern portion is situated within an hour or less travel time to the Minneapolis/St. Paul Metropolitan Area and continues to experience changes in land use. Agriculture is changing from the typical family farm to consolidation into larger farm units or diverted from agriculture and forest to rural homes or “hobby farms”.

The St. Croix Riverway contains an unusually high number and variety of endangered and threatened species. Although water quality is generally considered to be good in the Upper St. Croix and Namekagon rivers, activities in the tributaries and their watersheds affect the health of these rivers. In the Lower St. Croix, including Lake St. Croix, nutrient levels are elevated. Also, recreational and developmental pressures are intensifying in the lower portion of the St. Croix River and its watershed. Recreational use of the Lower St. Croix doubled between 1973 and 1993. Rapid population growth has occurred in St. Croix County, Wisconsin and Washington County, Minnesota, which border Lake St. Croix. Lake St. Croix, due to its proximity to the Minneapolis/St. Paul metropolitan area, is intensively used for recreational boating.

Water

Surface Water

The richness of the St. Croix Basin’s surface water resources are matched only by the diversity of terrestrial and aquatic wildlife supported by the transition zones between uplands and the many lakes, rivers, streams and wetlands. The water resources are integral to -- and in many cases define -- specific ecosystem structure and function. The insert that follows discusses an excellent example of this at a state natural area with naturally variable water levels and their effect on the surrounding forest community.

The St. Croix Mainstem

The St. Croix River originates at Upper St. Croix Lake near Solon Springs in Douglas County and flows approximately 160 miles to join the Mississippi River at Prescott. The 22 Wisconsin watersheds of the St. Croix River Basin (see Map 1) drain 4,828 square miles. Including the Minnesota watersheds, the St. Croix River drains 7,760 square miles. The drainage basin lies approximately 60% in Wisconsin and 40% in Minnesota. The upper 25 miles of the St. Croix River lie solely within Wisconsin. The remaining reach is the boundary between the two states. The Namekagon, which lies entirely in Wisconsin, begins at Namekagon Lake and flows 98 miles to its confluence with the St. Croix near Riverside, Wisconsin.

The upper St. Croix River is generally shallow with a rock, rubble, and sand bottom. At St. Croix Falls/Taylor's Falls is a 60-foot head hydropower dam built in 1902. Below the dam, the river flows through the "dalles" area in the vicinity of the two Interstate State Parks (WI-MN), a reach of deep water and steep rock faces. This is a narrow gorge of igneous rock cut from glacial meltwater 10,000 years ago. Below this reach, the river widens and the substrate becomes finer. The 27-mile stretch below St. Croix Falls to Lake St. Croix has many backwater areas and channels. Around Stillwater, MN, the river flow slows to form Lake St. Croix. Lake St. Croix is generally deeper than the rest of the river and has an organic and sand substrate. The river remains lake-like for 25 miles to its confluence with the Mississippi at Prescott.

INTERSTATE LOWLAND FOREST STATE NATURAL AREA

This natural area features a mature lowland forest on what is periodically an island in the St. Croix River. During high water, an old channel on the area's north side carries water and isolates the site. The forest canopy is composed of rather evenly spaced, tall, straight-trunked trees. Silver maple is the dominant species with scattered green and black ashes, hackberry, and ironwood. Most of the timber is mature, well over two feet in diameter, although pole timber occurs along the east side. Topography is irregular, with many linear levees and a few wet depressions shaped by flood conditions. On the northeast side is a small open marsh dominated by river bulrush, rice cutgrass, cordgrass, and reed canary grass. A rare sedge of similar habitats in northern Wisconsin occurs here. Nest records show such species as eastern wood pewee, brown creeper, red-eyed vireo, and indigo bunting being common; southern species such as cerulean warbler and blue-gray gnatcatcher reach their northern range limit here. Ecosystems: Southern Wet Forest (80 ac) Emergent Aquatics (10 ac) source: DNR Bureau of Endangered Resources, 2001.

Classification of the St. Croix and Namekagon by Wisconsin

In Wisconsin, a large portion of the St. Croix River is classified as an Outstanding Resource Water (ORW) for the application of water quality standards under the state's antidegradation rules. The entire Namekagon River from the outlet at Lake Namekagon to its confluence with the St. Croix, and the St. Croix from the St. Croix Flowage dam in Douglas County to the northern boundary of the St. Croix Falls city limits, is classified as ORW. The St. Croix is classified as an Exceptional Resource Water (ERW) from the northern city limit of St. Croix Falls to one mile below the State Highway 243 bridge at Osceola. The outstanding classification resumes from this point to the northern boundary of the Hudson City limits. From Hudson to the confluence with the Mississippi River, the St. Croix is classified as an ERW.

The ORW classification provides a level of protection beyond the water quality standards that apply to all state waters as it recognizes the highest quality water in the state. The ERW water designation recognizes high quality waters where wastewater discharges may already exist. New or increased wastewater discharges to ORWs are not permitted unless the effluent meets background levels of the receiving water. For ERWs, increased discharges from existing point sources may be permitted. New discharges to exceptional resource waters may be permitted from communities that currently are unsewered if it is the best way to solve a public health or groundwater contamination problem.

Biological Diversity

The St. Croix Riverway contains an unusually high number and variety of endangered and threatened species, indicative of a relatively well preserved, well surveyed, and biologically diverse terrestrial and aquatic environment ([Map 2: Land Cover](#)). More than 90 threatened and endangered species are found within the riverway (see Appendix A). Five specific river segments have been identified as areas that are especially important for rare species:

1. St. Croix River from St. Croix Falls dam to Osceola – winged mapleleaf mussel, St. Croix snaketail dragonfly and others.
2. St. Croix River from the confluence of the St. Croix and Namekagon downstream to the confluence of Wolf Creek. This segment is the longest and most pristine example of a large river ecosystem in the Midwest, in terms of its fauna. It has the only known viable population of the St. Croix snaketail dragonfly, possibly a new species of mayfly, and a distinct population of the southern brook lamprey. Good populations of listed and rare species, that generally are doing poorly elsewhere, are found in this segment.
3. St. Croix River from the dam at Gordon downstream two river miles
4. Namekagon River from Trego dam downstream to Mackenzie Creek
5. Namekagon River from the Hayward dam downstream five river miles.

Major tributaries to St. Croix segments with high concentrations of rare species include the Clam and Wood rivers in Wisconsin and the Kettle and Snake rivers in Minnesota. The Bureau of Endangered Resources reports that the high quality segment of the St. Croix from the Yellow to Sunrise Rivers is affected by inorganic sediments and that the Kettle and Snake rivers are major contributors to this problem.

Water Quality

Although water quality is generally considered to be good in the Upper St. Croix and Namekagon rivers, activities in the tributaries and their watersheds affect the health of these rivers. Land use varies greatly from the forested headwaters of the north to the agricultural downstream portion. Portions of the GMU are undergoing urban development pressure from the Minneapolis-St. Paul metropolitan area. In the Lower St. Croix, including Lake St. Croix, nutrient levels are elevated. In Wisconsin, in both the Kinnickinnick and the Lower Willow watersheds, over 1/3 of the land use is agricultural (49%; 38% respectively), pesticides have been detected in wells (130 and 27 detects), nitrate levels exceeding the enforcement standard have occurred (25% of 172 wells and 20% of 44 wells). CAFOs are located in both watersheds. While the Kinnickinnick River is an outstanding resource water, its watershed is experiencing tremendous growth and change. Currently, the communities of Roberts, Hammond, Baldwin and New Richmond are conducting feasibility studies for wastewater alternatives to serve the area's swelling population. Opportunities for innovative treatment systems or regionalization of facilities are options that should continue to be considered for long-term protection of the Basin's water resources.

Recreational pressures are also intensifying in the lower portion of the St. Croix River and its watershed. Recreational use of the Lower St. Croix doubled between 1973 and 1994. Recreational use has continued to climb since that time. Rapid population growth has occurred in St. Croix County, Wisconsin and Washington County, Minnesota, which border Lake St. Croix. Lake St. Croix, due to its proximity to the Minneapolis/St. Paul metropolitan area, is intensively used for recreational boating.

Squaw Lake TMDL

The first TMDL (Total Maximum Daily Load) completed in Wisconsin was approved by EPA in August 2000 for Squaw Lake in St. Croix County. The lake was listed on the Wisconsin 1998 303(d) List of Impaired Waters due to excessive nutrient loading from its watershed. Water quality in Squaw Lake is generally poor to very poor, falling in the eutrophic to hypereutrophic category. Mats of filamentous algae cover a large portion of the lake bottom, and summer algal blooms result in foul odors and an unsightly build-up of decaying algae on the shoreline. In addition, trophic conditions in the lake limit rooting depth for emergent vegetation used by the resident fish populations. As a result, these impairments impact the recreational/aesthetic value of the lake and stress sport fish populations.

As part of the TMDL, a site-specific phosphorus (P) concentration goal of 130 $\mu\text{g/L}$ was identified for the lake. The goal was based on best professional judgment of WDNR staff using available monitoring data and modeling tools. The receiving water capacity in this situation represents cleaning-up the waterbody 'to the maximum extent practicable.'

Specific to this TMDL, Squaw Lake is part of a larger priority watershed project, St. Croix Lakes Cluster Priority Watershed Project, that is planned to clean-up several lakes experiencing similar impacts in adjoining watersheds. As part of a financing plan for priority watershed and priority lake projects, long-term cost sharing and local staff funding is committed to the this project.

Dam Safety

Numerous rivers and streams throughout the St. Croix Basin have impoundments created by the placement of dams. Approximately 170 dams are in place on over 70 rivers and streams within the basin. Over time dams have been built for a wide array of uses, and have been in place at some locations for over 100 years. Chapter 31 of Wisconsin State Statutes regulates the construction, operation and maintenance of dams. Administrative Code NR 333 was created to provide for large dam design and construction standards. Large dams are defined as having a structural height of over 6 feet and impounding more than 50 acre feet of water or having a structural height of over 25 feet and impounding more than 15 acre feet of water. The St. Croix Basin Water Management Engineer administers the dam safety program with responsibility for inspections for dam safety, plan approval for dam repairs or modifications and dam construction, operation and maintenance oversight. In recent years a small number of dams have been removed, restoring segments of streams and rivers to a free flowing condition.

Hydropower Dams

Within the St. Croix Basin, 12 dams there are hydropower-generating facilities. In addition to the hydropower dam at St. Croix Falls, there are two hydro dams on the Namekagon, at Trego and Hayward. Hydropower dams are also present on the Eau Claire River at Gordon, the Clam River, and the Yellow River at Danbury. Two hydropower dams are located on the Apple River near Somerset and two are on the Kinnikinnic at River Falls. There are no hydropower dams in the Minnesota portion of the St. Croix basin. In portions of the St. Croix and other rivers, hydropower operations can markedly affect the habitat for freshwater mussel species. For example, the WDNR surveys in 1988 and 1989 below the St. Croix Falls dam revealed the presence of several rare species of mussels, including the winged mapleleaf, Quadrula fragosa. This species was found in a short, five-mile stretch of river below the dam. The species is considered the only remaining documented population of that mussel in North America. Flow patterns resulting from peaking operations of the Northern States Power dam at St. Croix Falls threaten the population. Dewatering of mussel beds was observed in the winter of 1989 and 1990 during nightly shut downs of the power plant. During this time frame, representatives from WDNR, MDNR, the National

Park Service, and Northern States Power began meeting to address the situation. A federal mussel recovery team was established by the U.S. Fish and Wildlife Service to propose protection strategies. In-stream flow studies and habitat assessment are part of the process to develop a mussel recovery plan. WDNR Bureaus of Water Regulation and Zoning, Environmental Assessment and Review, and legal staff have examined possible options and authorities to ensure adequate releases from the dam to protect the mussels. Under Section 31.02 Wis. Statutes, WDNR can establish minimum flows to protect public interests.

Historically, licensing for hydropower dams focused primarily on maximizing power generation. In 1986 Congress passed the Electric Consumers Protection Act (ECPA) requiring FERC to consider power and non-power values equally. This legislation came about as a result of public concern of the adverse effects the operation of hydropower dams have on aquatic resources and recreational use opportunities from wide fluctuations in stream flow. FERC has since developed a consultation process during re-licensing that involves hydro dam owners, resource agencies and the public to address issues of concern. This has resulted in added protection of the aquatic resources and improved recreational opportunities.

Selected Lakes

The St. Croix Basin has an abundance of aquatic resources. There are simply too many lakes to evaluate during a monitoring or assessment cycle. While all lakes are considered important, only named lakes 10 acres or larger and unnamed lakes 25 acres or larger are included in this plan (See Appendix A). Despite the exclusion of small lakes, there are over 800 lakes listed in this report. These waters range from 34 lakes that are larger than 500 acres to 258 lakes less than 25 acres.

On the St. Croix River, lakes include the headwaters at Upper St. Croix Lake at Solon Springs, St. Croix flowage at Gordon, and Lake St. Croix. Lakes on the Namekagon include Lake Namekagon, Pacwawong Flowage, Phipps Flowage, Lake Hayward (flowage) and Trego Flowage.

Upper St. Croix Lake

This lake is at the headwaters of the St. Croix River. In addition to its status as a major recreational resource, this waterbody was a part of the historic Brule-St. Croix portage. Early European explorers often stopped on this lake during the journey from Lake Superior to the Mississippi River. Upper St. Croix Lake has outstanding resource water status. It has an excellent fishery and provides significant aquatic recreational opportunities. This lake exhibits some symptoms of eutrophication that are somewhat unexpected in a headwaters waterbody. The village of Solon Springs sits on the west shore of this lake and did experience some historic problems with groundwater pollution from individual sewage disposal systems. This problem has been corrected with the installation of a municipal collection and treatment system.

Lake St. Croix

This 8,209-acre lake is a wide area in the St. Croix River extending from just downstream of Stillwater, MN to just downstream of Afton, MN. The lake receives some of the highest levels of recreational usage of any surface water in Wisconsin. A significant amount of long-term water quality data has been collected in and near Lake St. Croix. The lake was included in the 1974 National Eutrophication Survey. The Minnesota Pollution Control Agency (MPCA) has a long-term monitoring station near Hudson, WI and the Metropolitan Waste Control Commission (MWCC), St. Paul, MN, has two monitoring stations near the lake. The Legislative Commission on Minnesota Resources provided funding to the Minnesota-Wisconsin Boundary Area Commission and University of Minnesota to conduct an aquatic ecosystem assessment in the St. Croix River from Taylor Falls, MN, downstream to the mouth of the river.

Components of this study include a paleolimnological assessment of lake sediments and assessment of existing water quality data for Lake St. Croix. Lake St. Croix is currently considered a eutrophic lake. The MPCA has recommended a 40 ug/L mean total phosphorus concentration as a phosphorus goal for the lake. This goal represents a 50 percent reduction in the long-term mean total phosphorus concentration of 50 ug/L based on data collected by MPCA and the MWCC.

Groundwater

Groundwater is an important, yet often undervalued resource in the St. Croix Basin as it is the sole source of drinking water to residents in the Basin and recharges over 100 trout streams and countless lakes within the watershed. Once contaminated, groundwater may take many years and potentially large monetary resources to clean.

Geology

The geology of St. Croix ([Map 3: St. Croix Basin Bedrock](#)) makes its water supply particularly vulnerable to contamination. Shallow aquifers combine with coarse, often thin soils to transport surficial contamination to the groundwater. The principal aquifers are sand and gravel, sandstone, and limestone formations. The sands and gravels are more prevalent in the northern half of the St. Croix Basin.

The Jordon sandstone aquifer underlies the entire area of St. Croix County, and so far remains uncontaminated. Overlying the sandstone is the limestone aquifer, a highly fractured bedrock formation which contains many sinkholes and other Karst features. Well-developed horizontal and vertical crevices increase the potential for groundwater contamination by providing direct conduits from surface sources of pollution to the groundwater. Over time, cracks and crevices are enlarged by rain water which is slightly acidic. The enlarged crevices over time collapse, creating sinkholes or collapse features. Sinkholes can serve as collection points for surface water runoff, and nearby wells should be monitored to assure good water quality is maintained.

Contamination Potential

In an assessment of the St. Croix Basin's watersheds, the Kinnickinnic River Watershed had the highest contamination potential with a score of 81.69 out of 100. Pesticides were detected in 130 wells. Of 172 wells tested for nitrate, 25% exceeded the enforcement standard (ES) and 60% exceeded the preventative action limit (PAL). There is one confined animal feeding operation (CAFO) in the watershed. Land cover in the watershed consists of 49% agriculture, 21% grassland, 13% forest and 12% urban. Table x below reiterates these results and identifies other watersheds found to have high contamination potential based on land use and groundwater quality testing. All watersheds with high scores for potential groundwater contamination are currently enrolled in the priority watershed program (Kinnickinnic River, Lower Willow River, Upper Willow River, Lower Apple River, Balsam Branch, and Upper Apple River). [Map 4, Depth to Groundwater](#), underscores this information by showing the shallow soils in portions of the basin. Land use activities ranging from agricultural work to wastewater treatment discharges have a direct, negative impact on groundwater quality in this environment.

Generally, watersheds with the highest contamination potential have some of the highest population densities, and are likely to experience significant population increases along with rural house on-site sewage systems. With this population 100% dependent on groundwater for their drinking supply, the quality and safety of that water supply for the long-term is an area of concern.

Groundwater Contamination Susceptibility Map

Map 5, Groundwater Contamination Susceptibility Model, illustrates a compilation of data to affecting the susceptibility of groundwater to contamination. This data is based on type and depth to bedrock, depth to local water table, area soil and sub soil characteristics and land use activities. Areas of high susceptibility include a combination of a shallow water table (less than 20 feet), sand and sand/gravelly soil and subsoil characteristics, bedrock location greater than 100 feet from the surface and potential intensive land uses. Low to medium susceptible characteristics within the basin include a combination of greater depth to groundwater (greater than 50 feet), clay soil and subsurface characteristics and impermeable bedrock material. It is important to remember that a low risk site can become contaminated or that a highly susceptible site will not necessarily become contaminated.

Groundwater Contamination Potential Ranking by Watershed

Each watershed within the St. Croix River Basin was ranked based on land coverage and groundwater sample analytical results in the DNR's GRN database. The table below lists each watershed score and gives a short description of the land cover and groundwater sample analytical data that determined the score. Groundwater contaminants used for the ranking include nitrate and pesticides, as these are common nonpoint source contaminants. A score of 20 or more is considered medium. At 30 or greater, the score is considered high for groundwater contamination potential. Land cover in the basin consists mostly of forest and agriculture. Only a few watersheds have a representative number of groundwater samples (1 well sampled per 10 square miles) so many scores are based on land cover. There are seven permitted Confined Animal Feeding Operations in the basin.

Abbreviations include:

1. ES: Groundwater enforcement standard as per NR 140 Wis. Adm. Code. For nitrate the groundwater ES is 10 ppm.
2. PAL: Groundwater Preventive Action Limit as per NR 140 Wis. Adm. Code. For nitrate the groundwater PAL is 2 ppm.
3. CAFO: Confined Animal Feeding Operation that consists of the equivalent of 1000 animal units.

Table A: Groundwater Contamination Potential Ranking by Watershed

Watershed	Score	Comments
Kinnickinnic River	81.69	Pesticides were detected in 130 wells. Of 172 wells tested for nitrate, 25% exceeded the ES and 60% exceeded the PAL. There is one CAFO in the watershed. Land cover in the watershed consists of 49% agriculture, 21% grassland, 13% forest and 12% urban.
Lower Willow River	61.18	Pesticides were detected in 27 wells. Of 44 wells tested for nitrate, 20% exceeded the ES and 52% exceeded the PAL. There are 2 CAFOs in the watershed. The watershed consists of 38% agriculture, 31% grassland, 19% forest and 3% urban.
Upper Willow River	51.03	The watershed consists of 47% agriculture and 30% grassland. There are 3 CAFOs in the watershed.
Lower Apple River	45.15	There is one CAFO in the watershed. Of 87 wells tested for nitrate, 32% exceeded the ES and 47% exceeded the PAL.
Balsam Branch	43.83	Pesticides were detected in 60 wells. Of 131 wells tested for nitrate, 21% exceeded the ES and 57% exceeded the PAL. The watershed is 28% forest, 27% grassland and 25% agriculture.
Upper Apple River	14.00	The watershed consists of 43% forest, 23% grassland and 14% agriculture.

Beaver Brook	26.30	The watershed consists of 31% forest, 26% agriculture, and 22% grassland.
Trout Brook	50.21	Of 37 wells tested for nitrate, 8% exceeded the ES and 73% exceeded the PAL. Land cover consists of 37% agriculture, 29% forest and 22% grassland.
Wolf Creek	18.34	The watershed is 36% forest, 36% grassland and 17% agriculture.
Trade River	7.96	Land cover consists of 46% forest, 19% grassland, 17% wetland and 7% agriculture.
Wood River	6.53	The watershed is 37% forest, 24% wetland, 20% grassland and 6% agriculture.
Clam River	4.64	The watershed is 50% forest, 19% grassland, 18% grassland, and 4% agriculture.
North Fork Clam River	8.58	Land cover is 53% forest, 23% grassland and 8% agriculture.
Lower Yellow (Burnett Co.) River	0.81	The watershed is 56% forest, 17% wetland and 10 open water.
Shell Lake and Upper Yellow River	10.50	The watershed is 52% forest, 19% grassland, 9% wetland and 9% agriculture.
Upper Tamarack River	0.01	The watershed is 34% wetland and 58% forest.
Saint Croix and Eau Claire Rivers	0.01	The watershed consists of 62% forest and 27% wetland.
Upper Saint Croix and Eau Claire Rivers	0.08	The watershed is 68% forest.
Lower Namekagon River	0.76	The watershed is 63% forest.
Totagatic River	0.61	The watershed 66% forest and 20% wetland.
Trego Lake/Middle Namekagon River	2.72	The watershed is 64% forest and 16% wetland.
Upper Namekagon River	1.48	The watershed is 70% forest and 15% wetland.

Nonpoint Source Priorities

Table B, Watershed/Lake Status for the Priority Watershed Program, and Map 6, Priority Watersheds, illustrates existing priority watershed projects and those watersheds that have problems from nonpoint source runoff.

Table B: Watershed/Lakes Status for Priority Watershed Program

Watershed	Watershed/Lakes Status for Priority Watershed Program				Status	Drains To surface Drinking Water	Subwatershed or Small Scale Projects	Counties Included
	Watershed Name	Overall	Stream	Lake	GW			
SC01-270	Kinnickinnic River	High	High	NR	high	Active	PL/95-06: Pine L. (part of St. Croix Co. Lakes Cluster), Baldwin L.	St. Croix, Pierce
SC02-270	Lower Willow River	High	High	NR	high	Active	PL/94-06: Bass, Perch L. (St. Croix Co. Lakes Cluster project)	St. Croix
SC03-270	Upper Willow River	High	NA	NA	high	Closed	PWS-/840 Closed	Polk, St. Croix
SC04-270	Lower Apple River	High	High	Med	high	Active	PL/95: Horse Cr. Lakes in planning; High-LC: Cedar, church pine, wind lake, big lake, Pine, Lower Pine, Round	St. Croix, Polk
SC05-270	Balsam Branch	High	High	High	high	Active	PWS/92-00; High-LC: Balsam, Deer, Half Moon, Beartrap, Long, Wapogasset, Rice	Polk
SC06-270	Upper Apple River	Med	Med	High	low		High-LC horseshoe, pike, pipe, apple, big blake, big round, bone, staples, n. twin, s. twin, white sh. n. white ash	Barron, Polk
SC07-270	Beaver Brook	High	High	Med	med		High-L: Magnor	Polk, Barron
SC08-270	Trout Brook	NR	NR	NR	high	Active	SS/94-06: Osceola Cr.; PL/94-06: Squaw Lake (part of St. Croix Co. Lakes Cluster)	Polk, St. Croix
SC09-270	Wolf Creek	NR	NR	NR	low			Burnett, Polk
SC10-270	Trade River	Med	Med	NR	low		High-LC: big butternut, little butternut, long trade, round, big/little trade,	Burnett, Polk
SC11-270	Wood River	Low	Low	NR	low	Active	PL/95: Big Wood Lake in planning; lake cluster:mud hen, spirit, wood (big wood)	Burnett, Polk
SC12-270	Clam River	Med	NR	Med	low		High-L: ward	Burnett, Polk
SC13-270	North Fork Clam River	Low	NR	Low	low		High-L: Sand	Burnett, Polk, Barron, Washburn
SC14-270	Lower Yellow River	NR	NR	NR	low		High-L: big sand, sand	Burnett
SC15-270	Shell Lake, Upper Yellow River	NR	NR	NR	low		High-L: shell, lipsett	Burnett, Washburn
SC16-270	Upper Tamarack River	NR	NR	NR	low			Douglas, Burnett
SC17-270	St. Croix, Eau Claire Rivers	NR	NR	NR	low			Douglas, Burnett, Washburn
SC18-270	Upper St Croix, Eau Claire Rivers	NR	NR	NR	low	Active	PL/94-05: St. Croix Flowage/Up. St. Croix Lake;High-LC: Lower/middle/upper eau claire, upper st. croix	Bayfield, Douglas
SC19-270	Lower Namekagon River	NR	NR	NR	low		High-L: Big McKenzie, rooneey, webb, lower/middle McKenzie	Douglas, Burnett, Washburn
SC20-270	Totagatic River	NR	NR	NR	low		High-L: Bardon, bond, leader, nelson, minong flow.	Bayfield, Douglas, Washburn
SC21-270	Trego L./Middle Namekagon R	NR	NR	NR	low			Sawyer, Washburn
SC22-270	Upper Namekagon River	NR	NR	NR	low		High-L: namekagon	Washburn, Sawyer

Fisheries

The St. Croix Basin has a diverse fishery with 93 species collected by Fago (1986). Included in that study was the endangered crystal darter and the threatened speckled chub, blue sucker and gilt darter. Six species on the Department's watch list were also collected. The watch list species included the following: lake sturgeon, pugnose shiner, pugnose minnow, river redhorse, greater redhorse and least darter.

The St. Croix Basin has some of the premier sportsfishing waters in Wisconsin. The basin has a wealth of good largemouth and smallmouth bass lakes and rivers, including the St. Croix River, which is one of the top smallmouth bass rivers in the nation. Walleye and northern pike are very common in the lakes and rivers in the Basin. Muskellunge are found in a number of waters with abundant populations in such lakes as Bone and Deer in Polk County. Bluegills, black crappies and yellow perch are abundant especially in the lakes in the southern part of the Basin.

The Basin has an abundance of trout streams with the following species of trout: brook, brown and rainbow. The brook trout is the most common species of trout in the Basin. Nice sized brown and brook trout are to be found in the Namekagon River north of the City of Hayward. The Clam River, Yellow River, Sawyer Creek and Beaver Brook are excellent brown and brook trout streams in the central part of the Basin. In the southern part of the Basin the Kinnickinnic River has one of the highest densities of brown trout in the state. Trout densities range from 2,000 to 12,000 trout per stream mile. The Basin has a few trout lakes but these trout fisheries are maintained through stocking.

Wetlands

The wetlands of the St. Croix Basin are many and diverse. In the northeast, most are large alder thicket/swamp hardwood riparian wetlands and shallow marshes along the Totogatic, Namekagon, and Yellow Rivers and their tributaries. The Wood River, Clam River and Trade River wetlands are mainly silver maple bottomland hardwoods interspersed with shrub carr and northern sedge meadow. Coniferous and open bog wetlands are relatively common throughout the northern two thirds of the Basin. Conifer swamps, composed of a white cedar overstory, are relatively rare in this part of Wisconsin. The Kohler Peet Swamp, is a very large St. Croix River riparian wetland that straddles the mouth of the Clam River, and is an important deeryard with some old growth white cedar present. The southern end of the Northwest Sands has some of the largest intact and restored northern sedge meadows in Wisconsin. These wetlands are critical habitat for rare wildlife species such as yellow rails, LeConte's sparrows, and sharp-tailed grouse. Many of these meadows are being managed by DNR on Glacial Lake Grantsburg properties. Polk and St. Croix Counties, at the southern end of the Basin, mark the transition from northern forest and barrens to oak openings and tallgrass prairie. Wetlands in these counties are typically prairie potholes of one to twenty acres that are significant for their value to breeding and migrating waterfowl. Perhaps as much as 50% of the wetland area in the prairie pothole region of the Basin has been drained or otherwise degraded by human activity. Restoration efforts have been under way for a decade.

Lands

Land Cover Discussion

Below is a list of Land Cover Classifications and percentages for each found in the St. Croix Basin (see St. Croix Basin Land Cover Map 2), followed by a short discussion of the major land cover types.

Forest -	48.01%
Grassland -	16.64%
Wetland -	14.02%
Agriculture-	12.85%
Water-	4.55%
Shrubland-	3.18%
Urban/Developed-	0.43%
Barrens-	0.32%

Forest: The largest percentage in the land cover types is the forest classification totaling 48.01 % of the total land cover.

Much of the forested acres in Washburn, Burnett, Douglas, Sawyer and Bayfield County are in public ownership. The Burnett County Forest and Washburn County Forests are the largest landowners in these counties, followed by the Wisconsin Department of Natural Resources. These two northern counties also have substantial forestland owned by industry.

Forested acreage found in the southern part of the Basin is mostly non-industrial ownership.

Grassland: DNR and the U.S. Fish and Wildlife Service manage about 20,000 acres of grassland for wildlife within the watershed. Most of the remaining grassland is in an agricultural landscape. Since the Basin straddles the farm-forest transition, farms tend to be small, family run operations with diverse crops and covers including alfalfa, grass hay, small grains, USDA program fields, and non-cropped odd areas. All have seasonal value as grassland wildlife cover. Grassland cover provided by the Conservation Reserve Program has resulted in significant increases in grassland wildlife in Polk and St. Croix Counties where the program has idled between 10 and 12% of the cropland acreage.

Wetlands: Nearly every wetland type is represented within the St. Croix Basin. Some regionally rare types such as northern sedge meadow and prairie pothole are very common in the southern one-half of the Basin. Most wetlands in the north are forested with swamp hardwood or black spruce/tamarack.

Agriculture: Dairy farms are rapidly disappearing in the Basin. Former dairy acreage has been converted to row-crop agriculture in the south and hayland in the north. The primary crops are corn, soybeans, alfalfa and clover hay, and locally, cannery products such as green beans and sweet corn.

Shrubland: Most of this type is actually cutover jack pine and northern pin oak. On a few properties owned and managed by WDNR and the U.S. Forest Service, prescribed fire is used to maintain the brush prairie community. Shrubland in this context is critical to the continued survival of many rare wildlife species such as Blandings turtles, sharp-tailed grouse and Franklins ground squirrel.

Public Land Discussion

The majority of public land in the Basin is located in northern and western Burnett County; northern Washburn County; and southern Bayfield and Douglas Counties ([Map 7: St. Croix Basin Public Land](#)).

County Forests

County Forests in Douglas (261,456 acres), Washburn (148,216 acres), Burnett (105,969 acres), Polk (16,174 acres) and part of Barron County make up the majority of the public lands in the Basin.

State Wildlife and Fishery Areas

State owned Wildlife Areas and Fishery Area lands are located throughout the Basin. The largest of these are Crex Meadows Wildlife Area (27,467 acres) and Fish Lake (13,197 acres) in western Burnett County.

State Forest

The Governor Knowles State Forest (19,343 acres) is located along the St. Croix River and stretches 55 miles from northern Burnett County into northern Polk County.

State Parks

Three state parks are located in the St. Croix Basin. Interstate Park is located just south of the City of St. Croix Falls in Polk County. Two State Parks are located in St. Croix County. Willow River State Park is located near Hudson, while Kinnickinnic State Park is located near River Falls.

Federal Lands

The US Forest Service manages a portion of the Chequamegon National Forest in the northeast most portion of the Basin, while the National Park Service manages the St. Croix National Scenic Riverway that runs through Sawyer, Washburn, Burnett, and continues along the west boundary of St. Croix and Pierce Counties.

Other federally owned public Waterfowl Production Areas can be found in St. Croix and southern Polk counties.

Ecological Landscapes

The “**Ecological Landscapes of Wisconsin**” are illustrated on [Map 8](#). The following ecological landscapes are all represented in the St. Croix Basin: 1) Northwest Sands, 2) Farm-Forest Transition, 3) Western Prairie, 4) Northwest Lowlands, and 5) North Central Forest.

The St. Croix Basin contains primarily the Northwest Sands, the Farm- Forest and the Western Prairie landscape categories

Northwest Sands

This Ecological Landscape (EL) is a large pitted outwash plain that ranges in topography from nearly level to rolling hills. Soils are primarily sands that are low in inorganic matter. There are several hundred kettle and seepage lakes scattered throughout the region that range from less than 10 acres to hundreds of acres in size. The headwaters of the St. Croix River is found in this ecological landscape. Dry forests composed of jack pine, red pine, and northern pin oak dominate the upland vegetation community. Three rare natural community types are found in the Northwest Sands: oak savannah in the south, pine barrens in the mid-section, and red and white pine savannah in the north. These three types also have an association of native warm season grasses and forbs that comprise much of the ground layer flora.

Wetland communities of the region are highly diverse and include northern sedge meadows, alder thickets, conifer swamps, open bogs, hardwood swamps and floodplain forest. Major land uses are forestry, recreation, and tourism as well as limited agriculture in the southern part of the ecological landscape.

Farm-Forest Transition

This Ecological Landscape (EL) is characterized by the mix of forest, agriculture, and swamp in the transition zone between northern forests and central hardwoods. Small kettle lakes are common on the moraines in the western lobe of this EL, but there are very few large lakes and few streams in the remaining portion of the EL. Soils are diverse and range from sandy loam to loam and shallow silt loam (both poorly drained and well drained). Vegetation is mainly northern hardwood forest dominated by sugar maple, with some oak, yellow birch, red pine, and white pine. Major land uses are agriculture and forestry. Agriculture is focused on dairy farming, row crops and pasture.

Western Prairie

This Ecological Landscape is characterized by its driftless (rolling old drift) topography and a primarily open landscape with rich prairie soils and pothole lakes, ponds, and wet depressions. The mosaic of soils are silty, shallow and stony, alluvial sands and peats, and stony red clay subsoil. Vegetation is comprised of prairie grasses in the least dissected and rolling areas and wet prairies in the broad depressions. Open oak savannas and barrens are found on the hilly topography, with small inclusions of sugar-maple-basswood forest in small steep sites. Pothole type wetlands are mainly found in St. Croix County and southern Polk County. Dairy farming and grain agriculture are the primary land uses in the area. The area has strong urbanization pressure from the Twin Cities.

Northwest Lowlands

This Ecological Landscape is characterized by ground moraine covered with extensive peatland and pine, hardwood and aspen forests. The ground moraine soils are loamy or stony sands and glacial drift is generally calcareous. Historically vegetation was conifer-hardwood forest consisting mainly of white pine and red pine. Aspen-birch forest, conifer swamps, and bogs were also found. Present vegetation is still a mixture of conifer-northern hardwood forest and many types of wetlands. Current land use is forestry for timber and pulp production, recreation and tourism, and a very small amount of agriculture. Large areas of uninhabited land make this area particularly suited for wolves.

North Central Forest

This Ecological Landscape is characterized by end and ground moraine with extensive northern hardwoods and large wetlands. There are almost no lakes on this ground moraine. There are many small creeks, rivers, and kettle lakes. Soils are primarily acid silt loams, podzolized, rocky, and often poorly drained, over underlying acidic, reddish sandy loam till. There are also areas of loam and loamy sand soils. Vegetation is primarily hardwood forest, made up of a mix of sugar maple, basswood and red maple, along with hemlock, red and white pine. There are many wetlands that are associated with kettles and streams. The major land use is forestry for timber and pulpwood production. There is marginal agriculture with some dairy farms using pastures.

Wildlife

The St. Croix Basin, because it covers portions of five different ecological landscapes, has a wide variety of habitats and an extremely diverse complement of wildlife.

The northern forest portion of the Basin is found in Burnett, Washburn, and parts of Douglas, Bayfield and Sawyer counties. The main habitat in these counties consists of extensive forest that is largely owned by county, state, or industrial forest landowners. The eastern timber wolf, black bear, fisher, and bobcat are typical northern forest species that are most abundant in these northern counties but are also being found in increasing numbers in the southern counties in this Basin. Deer populations have flourished due to a series of mild winters, extensive logging, and recreational feeding. Eastern timber wolf numbers have followed deer numbers and southern Douglas County has one of the highest wolf pack densities in the northern region. Wolf packs have also established in Burnett, and Washburn counties with occasional sightings of lone animals in Polk and Barron counties. Black bear populations are near established population goal levels and, although they are most numerous in the northern forest counties, they can be found in increasing numbers in the southern counties of the Basin. Forest game species, such as ruffed grouse, woodcock, and snowshoe hare, are featured species that do best in early successional forest habitats, especially aspen.

The featured open-land bird species in the Northwest Sands Landscape Ecosystem of Burnett, Washburn, Douglas and Bayfield Counties is the sharp-tailed grouse. Aggressive management using prescribed burning to set back forest succession on the Namekagon Barrens in northeastern Burnett County, Crex Meadows in southwestern Burnett County, and the Douglas County Wildlife Area in Douglas County, is allowing this brush/prairie species to remain in huntable numbers. A federally listed insect, the Karner Blue Butterfly is also uniquely adapted to portions of the NW Sands and does best in open landscapes containing its host plant the Northern Blue Lupine. County, state and federal governments are participating in efforts to preserve this rare species by participating in an approved habitat conservation plan.

Polk and Barron counties could be best characterized as transition zone counties that have components of northern forest species as well as southern farmland species, such as eastern wild turkey, ring-necked pheasant, gray and fox squirrel, and eastern cottontail rabbit. Wild turkeys, in particular, have been quite a success story and currently exist within the Basin south of Douglas and Bayfield Counties. St. Croix County is a true farmland county and has some of the best "wild" pheasant populations in the state.

Recognizing the potential in St. Croix County and northern Polk County not only for pheasants but also waterfowl and grassland birds, these areas have been designated as the "Western Prairie Habitat Restoration Area" for the purpose of buying and easing land to restore grasslands and drained wetlands.

Because of the extensive wetlands in the Basin, aquatic furbearers can be found here in abundance: including beaver, otter, mink, and muskrat, as well as raccoons. These extensive and diverse wetlands also support diverse and abundant amphibian populations. Eleven of the 12 frog and toad species in the state are present as are all 9 species of salamander. Snakes and turtles are well represented, including the state threatened Blandings and Wood Turtle and a species of special concern, the Eastern Spiny Softshell Turtle, which is found primarily in the St. Croix River drainage system.

Substantial populations of resident and migratory waterfowl would also have to be considered one of the trademarks of this Basin. An increasing population of resident Canada geese, along with a substantial Mississippi Valley Population of geese that passes through the area, creates an impressive sight in the spring and fall. Mallards, wood ducks, and blue-winged teal are the main resident duck species, but

suffice it to say most species of ducks in the flyway pass through this area in spring and fall. The endangered trumpeter swan has been successfully reintroduced in the Basin and currently has the highest number of nesting pairs found anywhere in the state.

Birds of prey (raptors) have made an impressive comeback and nesting bald eagles are common throughout the Basin. Ospreys are not as abundant as eagles but are slowly increasing partly due to successful efforts at placing nesting platforms. Red-tailed hawks, northern harriers and kestrels are extremely abundant due to extensive grasslands and farm fields. Cooper's, sharp-shinned and broad-winged hawks of the woodlands are also abundant, as are great horned and barred owls.

Songbirds that utilize all northern habitat types can be found in the Basin. Forest birds such as woodland warblers, vireos, thrushes, and scarlet tanager are all favored by extensive forest, especially in the north. Mixed habitat birds flourish in the fragmented forests in the southern counties. Meadowlarks, bobolinks, upland sandpipers, and other grassland birds benefit from some agricultural lands, CRP grasslands, and grass habitats on State Wildlife Areas. The Basin also supports a rich and diverse assemblage of non-game wetland and water oriented bird species. Some of those that nest within the Basin include loons, grebes, cormorants, herons, rails, yellow-headed blackbirds, kingfishers and sandpipers.

Forests

Northern forests are changing. The primary causes of change in Wisconsin's forests are natural successional processes, growth, mortality, and natural disturbances, as well as human induced changes such as harvesting, other forest management activities and land use changes. These change factors often result in reclassifications from one forest type to another.

Below is a description of the present forest situation using the Ecological Landscape (EL) system for describing the different ecological divisions found in the St. Croix Basin (see Map 8).

Northern St. Croix Basin

Northwest Sands Ecological Landscape

Dry forests composed of jack pine, red pine, and northern pin oak dominate the upland vegetative community in this Ecological Landscape. These forest communities are changing dramatically across this landscape in the Basin.

The acreage of the jack pine timber type is falling due to the death of over-mature jack pine trees and the difficulty in regenerating the species. Primary agents at removing this species at maturity are the "jack pine budworm" insect, timber harvesting and wind damage. Jack pine historically regenerated back to the jack pine species in pre-settlement periods after large fires. The difficulty of the practical use of fire, browsing by high deer populations, and limited practical use of herbicides makes the retention of the historic levels of jack pine acreage difficult. Greater economic returns in planting red pine and little to no investment cost in allowing the forested site to naturally convert to the oak or aspen timber type are additional influences that lower the jack pine timber type acreage. Efforts in regenerating jack pine are being made, primarily on publicly owned land, often with state grants for habitat maintenance.

The aspen acreage in the Northwest Sands EL is increasing as aspen replaces jack pine after harvest. Northern pin oak acreage is also increasing as natural succession takes its course from lack of harvest on private lands and due to natural conversion after jack pine harvests.

Attention is being given to allowing natural conversion or where appropriate assisting the conversion from existing stands to three natural community types, oak savannah in the south, pine barrens in the mid-section, and pine savannah in the north portion of the EL. These three types also have an association of native warm season grasses and forbs that comprise much of the ground flora and provide benefits to wildlife.

North Central Forest Ecological Landscape

Forest vegetation across this Ecological Landscape in the Basin is primarily hardwood forest, made up of sugar maple, basswood and red maple along with red and white pine.

In the North Central Ecological Landscape (EL) white birch, as a timber type, is decreasing dramatically due to lack of fire, over-maturity of the timber and natural succession to other types. Agents at removing this even aged species have generally been drought, often followed by pathological agents such as the bronze birch borer and other insects. White birch is difficult to regenerate across the landscape as timber type and is often being replaced only as an associated species.

Other timber species that are difficult to regenerate and are decreasing in number are hemlock, Yellow birch, American elm, and northern red oak.

The northern red oak timber type is decreasing as these timber stands reach the age of pathological maturity. The natural succession of red oak stands to northern hardwoods and red maple timber types is the trend across this landscape. Mechanical site preparation in conjunction with the harvest of mature red oak stands is being used to maintain/regenerate this timber type under selected conditions. Turkey stamp monies are available to financially assist with practices employed to maintain this important type for turkey habitat. The large deer herd can be a deterrent in the success of regeneration practices to maintain species such as red oak and yellow birch within the ecosystem.

Aspen harvests (clearcuts) are used to successfully regenerate the aspen timber type in this EL. However, over the entire landscape aspen is decreasing and often converting to other less shade tolerant species such as sugar maple, and other northern hardwoods.

Across the landscape tree species in the northern hardwood timber type are growing into larger trees. Trees in the pole size timber classification are entering into a small and large diameter sawlog size classification of timber. Rural development resulting in parcelization is removing increasing amounts of the land in the ecological landscape out of timber production, and reducing wildlife habitat otherwise provided by the timber types in this landscape.

Southern St. Croix Basin

Farm-Forest Transition Ecological Landscape and Western Prairie Ecological Landscape

Forest vegetation in the Farm-Forest Ecological Landscape is mainly northern hardwood forest types dominated by sugar maple, with some oak and yellow birch, red pine, and white pine.

The Western Prairie Ecological Landscape is dominated by two forests. The first is predominantly pin oak, bur oak, white oak, red oak, aspen, and red maple, often with an understory of prickly ash and ironwood. The second is occupied by the same northern hardwood species found in the Farm-Forest Ecological Landscape.

Due to the expansion of the Twin Cities population into these ecological landscapes (EL), suburban building is increasing. Parcelization of larger tracts of land is taking place as larger agricultural ownerships are being broken off into smaller parcels.

An increase in applications and entry into the Managed Forest Law (MFL) has occurred in part due to an increase in property taxes. Each MFL entry requires a “Managed Forest Stewardship Plan” and a contract to manage forest stands according to sustainable forest principals for either a 25-year or 50 year contract period.

This increase in active forest management, and wildlife habitat management, by contract, will have a positive influence on forests, wetlands, and wildlife in this EL.

The natural succession of red oak stands to northern hardwoods and red maple timber types is the trend across this landscape. Artificial regeneration by planting acorns and seedlings is showing promise and is often assisted financially by Turkey Stamp money to retain turkey habitat.

Basin Economic and Social Context

Population & Housing

Coverage area summary. The portion of the St. Croix River Basin within Wisconsin covers an area of 4,165 sq. mi. (10,788 sq. km.) and encompasses nearly all of Burnett and Polk Counties, in addition to comprising significant portions of Douglas, Washburn and St. Croix Counties. Peripheral portions of the Basin are found in southwestern Bayfield County, northwestern Sawyer County, and the extreme northwestern portions of Pierce and Barron Counties. Map 9 The St. Croix Basin, Wisconsin and Minnesota Sides illustrates the expanse of the St. Croix River Basin.

Population density summary. The overall population density of the St. Croix River Basin is, in general terms, greater in the southern counties of Pierce, St. Croix and Polk and becomes less dense northward into Burnett, Washburn, Douglas, Bayfield and Sawyer Counties. The basin is characterized as primarily rural while some portions in the less-populous north have moderately sized public holdings including the St. Croix and Namekagon River National Scenic Riverway, numerous county and state forest lands and several state wildlife preserve areas.

The most populous municipalities within the Basin (based upon 1990 Census data) are the City of River Falls (population: 8,841), City of Hudson (6,378), City of New Richmond (5,106), Town of Hudson (3,692), City of Prescott (3,243), Village of North Hudson (3,101), Village of Ellsworth (2,706) and the City of Amery (2,657). As is indicated on the population density map (Map 10), population density exceeding 20 or more persons per square mile are found throughout Polk, St. Croix and Pierce County portions of the Basin, with similar densities found adjacent to the incorporated villages, cities and developed lakeshore and riverfront sites in the Basin.

Population Change, 1990-1999. Population change data for the period between 1990 and 1999 is taken from the federal Census (1990 data) and the official town, village and city estimates prepared by the Wisconsin Department of Administration Demographics Services Center (1999 data).

The population change trends from 1990 to 1999 are depicted in Map 11, and reveal a continued population growth in the Basin. Only seven towns in the basin demonstrated a population loss—and those seven were all a decrease of 10 percent or less—from 1990 to 1999. All remaining municipalities demonstrated population increases, with the most prominent percentage increase taking place in north-central Burnett County, south-central Douglas County, eastern Washburn County, and the townships in Polk, St. Croix and Pierce Counties which are directly adjacent to the St. Croix River.

Population Change, 1980-1990. Map 12 illustrates the change in population by percentage reported by each municipality from the 1980 and 1990 federal Census. In marked contrast to the growth demonstrated from 1990 onward, population changes in many areas of the Basin were in decline between 1980 and 1990. Of note, areas adjacent to the St. Croix River and areas of developable lakeshore demonstrated a steady increase in population from 1980 to 1990 and have continued the trend through 1999.

Housing Density. As is illustrated in Map 13, housing density closely follows the pattern of population density, with additional significant high-density areas in the lake districts of the St. Croix Basin. Developable lakeshore and riverfront areas sustain a variety of permanent and seasonal residences and to a small degree some commercial activity in the form of resorts, restaurants, taverns and related tourism and hospitality business. Areas of high housing density with low to medium population density include the lakes of central Burnett County, southern Douglas County, northwestern and eastern Washburn

county, central Polk County and western St. Croix County. [Appendix B](#) contains a listing of Exceptional Resource Waters and Outstanding Resource Waters located in the St. Croix Basin. Several of these bodies of water are located in areas of high housing density.

Total Housing Change, 1980-1990. Information from the two previous federal Census reports indicates a continued steady growth in housing units throughout the Basin. The largest percentage increases in housing growth have occurred—not surprisingly—concurrent with areas illustrating population growth. [Map 14](#) depicts the total housing change for the decade from 1980 to 1990. There is prominent growth (by percentage) in western and north-central Burnett County, western and central Polk County, south central Douglas County, western St. Croix County, northwestern and eastern Washburn County as well as the portions of Bayfield and Sawyer County falling into the St. Croix River Basin.

Seasonal Housing. [Map 15](#) illustrates the percentage of seasonal housing at the Census block level from Census 1990. As might be expected, seasonal housing is concentrated in areas known for their developed lakeshore, riverfront and access to related outdoor recreational resources. The highest percentage (above 85%) is found in the Town of Webb Lake in northeastern Burnett County, with the surrounding townships in Burnett, Washburn and Douglas County also exceeding 60 percent. Other areas with high percentages of seasonal homes in the Basin include the eastern portions of the towns in southern Douglas County and southwestern Bayfield County, the central portions of Polk County and a small portion of western Barron County.

The high housing density and low percentage of seasonal housing units found in southern Polk County, western and central St. Croix County and northwestern Pierce County coupled with the proximity of these areas to the metropolitan region of St. Paul-Minneapolis, suggest these areas are the focus of pronounced continuing permanent residence development rather than new seasonal home taking place elsewhere in the Basin.

The data presented in Maps 16 and 17 provides further evidence of *the development of permanent housing in the southern counties of the basin, in contrast to the seasonal housing development in the northern portions of the Basin*. The towns directly along the St. Croix River in northwestern Pierce County, western St. Croix County and southwestern Polk County have all demonstrated a decrease in the percentage of seasonal housing units from 1980 to 1990. This suggests a both a continuing conversion of seasonal units into permanent units and that new permanent unit construction is outpacing the development of new seasonal units.

Pronounced increases from 1980 to 1990 in the percentage of total housing units that are seasonal units are found in the central lake areas of Burnett County, northwestern and northeastern Polk County, and south-central and southeastern Douglas County. The towns of Gull Lake and Sarona, as well as the City of Shell Lake in Washburn County also demonstrated significant percentage increases in seasonal homes between the 1980 and the 1990 Census.

Summary. A cursory analysis of the population and housing data and changes over time throughout the St. Croix tend to reflect the following overall trends:

- *Sustained and continued increase in permanent resident population with the most significant increases found in traditionally less populated municipalities.*
- *Continued basin-wide growth in the number of housing units. The southern counties of the Basin, especially St. Croix County, are seeing a significant increase in permanent housing units due to their proximity to the Minneapolis/St. Paul urban area. St. Croix County showed the largest population percentage increase in the state, increase of 2.53% between April 1, 2000 and January 1, 2001. This*

trend does not seem to be lessening at the time of this report's publication. The northern counties of the Basin are seeing a continued increase in both seasonal and permanent housing unit development.

- *Overall dispersal of individuals and households out from the incorporated areas into the surrounding unincorporated areas for the amenities of privacy, aesthetic and scenic beauty and quality of life.*

Smart Growth Planning

In 1999 the Wisconsin legislature passed "Smart Growth" legislation which requires local communities (towns, cities, villages, counties and regional planning commissions) to use a consistent framework and definition for what constitutes a "comprehensive plan." This legislation also provides a grant program for distribution of funds for this planning. This grant program is administered by the Office of Land Information Systems (OLIS) with approvals from the Wisconsin Land Council and Department of Transportation. Map X shows which communities in the state applied for and received grants under this program in 2001. As the map shows, quite a few communities applied for grants in the St. Croix basin, including Anderson, LaFollette, Hammond, Roberts, Baldwin, Eau Galle, Menomonie, Colfax, Milltown, Rice Lake and portions of Washburn County. Any local governmental level may develop a comprehensive plan. Many plans are being developed at the county level, providing coverage for individual townships. Likewise, villages and municipalities are also developing such plans – in some areas, this work is being completed either by or with the guidance of regional planning commissions.

Comprehensive plans help to provide a rational basis for land use decision-making. By January 1, 2010, all communities which make land use decisions will need to base those decisions on an adopted comprehensive plan derived from the new statutory language. For some communities, these requirements will be a new way of conducting land use decision-making. The new statutes state that a comprehensive plan shall contain all nine elements: issues and opportunities; housing; transportation; utilities and community facilities; natural and cultural resources; economic development; intergovernmental cooperation; land use; and implementation. The DNR has developed a strategy for assisting local communities assemble data related to natural resources and has put together a series of data sets for use by external agencies in the development of their plans. The approach involves first conducting a survey of planning efforts in the regions. Then, ranking those efforts by considering the levels of involvement outlined below, which consider the quantity and quality of the resource, the risk to the resource, the spatial area covered by the planning effort, and the activity relative to our partner groups' priorities. Three levels of involvement have been outlined for DNR staff to help communities in their planning effort:

- Level I: All requests to DNR should result in a Level I response as an expected minimum level of effort.
- Level II: A local government requesting Department assistance, having significant local resources, and demonstrating opportunities to protect or restore those resources might result in a response along the lines of Level II.
- Level III: A regionally significant resource (or a planning process which covered a large number of significant resources), a good relationship between the department and local government, and the likelihood of substantial resource benefits would likely result in involvement such as that in Level III.

During 2001 the DNR Land Use Team has provided extensive substantive reviews to the UW-Extension Program in their development of a Guide to Developing the Natural Resources. In both the DNR West Central and Northern Regions, management and staff are preparing to provide such assistance to countywide and individual communities. Level I planning will be provided to all that ask; however, staff are preparing for Level III responses to county level requests.

Basin Resource Threats List

In developing the listing of issues and threats in the Basin, input was sought through the Wisconsin St. Croix Basin External Partners, citizen involvement in the County Land and Water Resource Plan development, public listening sessions and Department of Natural Resources staff. While the lists are extensive, some issues have been identified for special emphasis during this plan period. Priority issues identified by the WI St. Croix Basin External Partners Team is listed on page 1.

The following is a list of issues or areas that have been identified as present or potential threats to St. Croix Basin resources. When comparing this listing to the Partnership Priority Issues on page 1, note that many of the priority issues are identified as basin resource threats. The list is organized by main categories with specific impact items identified.

Motorized Recreation Impacts

- Damage to Aquatic Habitat
 - Suspended solids
 - Erosion
 - Destroys aquatic vegetation
 - Disturbs fish and wildlife (spawning, nesting)
- Damage to Terrestrial Areas
 - Erosion
 - Damage to trails (improper seasonal uses)
 - Disrupts wildlife movement patterns
 - Noise/access to lands (social issues)

Development Impacts

- Shoreline development: loss of riparian habitat, degradation of water quality, loss of fish and wildlife habitat.
 - Increased development around small waterbodies and wetland complexes
 - Loss of value for many wildlife species
 - Development threatens wetland functions such as flood control and groundwater filtration
- Land fragmentation: loss of large industrial forest block ownership, larger tracts broken into smaller parcels (80 acres becoming 10 and 20 acre parcels), loss of access to private lands (fewer places available for hunting complicates management strategies for wildlife, especially deer).
- Loss of grassland wildlife values for nesting and brood cover with conversion of livestock-based farming to cash crop systems.
- Wetland degradation – new septic laws may adversely impact.
- Groundwater contamination due to concentration of onsite septic systems, and wells not properly abandoned.
- Groundwater quality and quantity protection.
- Lack of proper zoning.
- Erosion/sedimentation due to road construction or renovations.
- Urban sprawl and related stormwater problems including stormwater infiltration practices and their effect on groundwater quality.
- Industry: point source pollution, thermal pollution.
- Surface water quality degradation, i.e. cranberry operations.
- Aeration projects (loss of habitat for minnows).
- Loss of habitat: grasslands, wetlands, barrens, and changes in forest types to the detriment of certain species.

Agricultural Impacts

- Changes from small dairy to row crops and large confined animal feeding operations.
- Loss of grasslands and cropland used for forage.
- Existing poor management practices (i.e. barnyard runoff, streambank erosion, and manure management).
- Deer farming and other captive wildlife.
- Fish farming.

Dam Impacts

- Peaking vs. run of river (reduction of living space for fish and invertebrates).
- Block migration runs for fish species.
- Disruption of in-stream energy transport (disruption of stream ecosystem).
- Thermal impacts.

Exotics

- Introduction and spread

Loss/potential loss of endangered/threatened species

- Loss of genetic diversity.

Animal Damage

- Manage wildlife populations at the appropriate designated management goals

Over-harvest of Fish

- Increase in fishing pressure along with advanced fishing equipment technologies poses threats to maintaining quality sport fishery on many Basin lakes.
- Large numbers of waters with limited staff resources precludes ability to obtain current survey data to assess sport fish populations on a timely basis.

Forest Ecosystem Changes

- Changes in forest habitat in Northern Forests to the detriment of certain species.
- Need to protect endangered and threatened species.
- Loss of Barrens habitat.

Feeding of wildlife (concentrations increases disease, etc.)**Toxics (copper, mercury, fish contamination)**

- Insufficient data available on the distribution and impacts of toxics in water and biota in the Basin.
- System is lacking to identify key areas and projects for remediation.

Solid waste – landfills**Lack of data/information needed to manage**

- Lack of data on water quality, quantity and ecosystem health inhibits the productivity and effectiveness of resource management.

Public Education

- Public understanding of ecosystem processes and issues is necessary for truly effective, long-term ecosystem health and support.

Lack of staff and funding

- DNR currently lacks the staff and levels of funding needed in key program areas to be able to fully protect and manage resources to their potential.

Programs, Goals and Objectives

The Department's Strategic Plan provides guidance for this agency in directing emphasis toward ecosystem management, integration of programs, and strengthening our relationships with our external partners to accomplish our natural resource goals. Through the biennial work planning process, program were directed to develop plans that will further the implementation of the Strategic Plan goals of:

- I. Making People our Strength
- II. Sustaining Ecosystems
- III. Protecting Public Health and Safety
- IV. Providing Outdoor Recreation

This Integrated Basin Plan will provide program guidance for development of future work plans. Programs have developed goals and objectives that will further the mission of this Department through implementation of strategies identified in the Strategic Plan.

Division of Water

The Departments Division of Waters is comprised of three Bureaus that engage in management and regulatory activities across the broad spectrum of water issues throughout the State of Wisconsin and adjoining boundary waters. These Bureaus are Drinking Water and Ground Water, Fisheries Management and Habitat Protection, and Wastewater Management. Within each Bureau are management sections that are assigned responsibilities to address specific water related management issues as prescribed by State Statutes, Administrative Codes and Department policy.

Following are program statements that will address water issues as related to identified needs within the St. Croix Basin, and where staffing resources are assigned to implement planned work activities. It should be noted that Watershed Management and Fisheries Management and Habitat Protection bureaus have multiple statements due to the diversity of program staff responsibilities within the Bureau sections.

Drinking Water and Groundwater

Program Goals:

Goal III. Protecting Public Health and Safety: Our lands, surface waters, groundwater, and air are safe for humans and other living things that depend upon them. People are protected by natural resource laws in their livelihoods and recreation.

Strategies:

- Achieve groundwater quality levels that protect the health of all living things, and meet state and federal standards for all pollutants.
- Provide adequate supplies of clean drinking water.

Goal II. Sustaining Ecosystems The state's ecosystems are balanced and diverse. They are protected, managed and used through sound decisions that reflect long-term considerations for a healthy environment and a sustainable economy.

Strategies:

- Achieve groundwater quality (and quantity) levels that protect the health of all living things, and meet state and federal standards for all pollutants.

Authority and Funding Sources:

The Department gets its authority to protect groundwater quality and public health from the federal Safe Drinking Water Act and Chapters 280, 281 and 160 of the Wisconsin Statutes. Under the authority granted by these laws, Wisconsin Administrative Codes NR 809, 811, 812 and 140 were written. These codes specify minimum public and private water system construction requirements, drinking water quality standards, and drinking water quality monitoring requirements. NR 140 establishes groundwater quality standards used in regulating activities that do or may affect groundwater quality.

Funds to run our program comes from the federal government, through Safe Drinking Water Act funding, and the state, through general program revenue dollars.

Description of our core work:

The Groundwater and Drinking Water Program has responsibility to assure the provision of safe, high quality drinking water and the protection of the groundwater. This is achieved by enforcing minimum well construction and pump installation requirements, conducting surveys and inspections of water systems, investigation and sampling of drinking water quality problems, and requiring drinking water quality monitoring and reporting. The program is staffed by a team of specialists, engineers, hydrogeologists, a program expert, and program assistants.

Drinking water staff geographic work assignments range from two or three counties for each specialist, to multiple counties (half of the region) for engineers and program assistants, to the entire 18-county region for the program expert and hydrogeologist.

Here is how groundwater quality and public health are protected:

Sampling: Passage of the Safe Drinking Water Act 25 years ago opened a new era in testing public water supplies to ensure that the glass of water you draw from the tap is safe. Operators of public water supply systems are required to monitor their water to make sure it does not exceed the Maximum Contamination Level (MCL) for 80 different microbial and chemical contaminants. When a public water system exceeds a drinking water standard, it must notify the public of the violation, identify the source of the problem, take corrective action if necessary and do follow-up sampling.

The amount and frequency of required sampling is determined by the type of contaminant and the size (population) of the public system. Public water systems range from large municipalities to small, rural resorts, restaurants, schools, and churches.

Proper well construction: Water systems, whether public or private, must be located and constructed to certain minimum standards. These standards, which employ widely accepted sanitary engineering principles and techniques, provide water systems and groundwater sources protection from contamination.

Inspections: Public water systems are inspected by drinking water staff every 5 years. Staff conduct well construction site field surveillance of well drillers and pump installers to ensure private well construction requirements are utilized. Staff also investigates drinking water quality or well complaints, and does inspections of newly constructed wells.

Protecting the source: Protecting groundwater means preventing what goes on the ground from going into groundwater. For example, by looking at soil and rock types, thickness of soil and rock layers, and depth to the groundwater, Department staff can make decisions about where

waste can be spread or where a landfill can be safely constructed. Identifying and documenting the presence (or absence) of potential contaminant sources in the vicinity around wells is also a mechanism for proactive protection of a water supply.

Technical assistance to well owners and the public: Staff provides assistance to public and private well owners to help solve water quality complaints and water system problems. They also provide interested citizens with informational or educational materials about drinking water supplies and groundwater.

Resource concerns: This plan includes a section on issues and threats compiled from contacts with our Basin Partner Teams, meetings with the public, and interviews with staff. Threats were also identified in county land and water resource plans and recent department publications. Here are some of the threats and issues specific to the Drinking Water program:

- Development pressures leading to water quantity concerns: increased use and multiple uses of groundwater from a single aquifer.
- Groundwater contamination due to concentration of onsite septic systems, improper well construction or improper abandonment of old wells.
- Improper application of wastes, by-products, agricultural chemicals, etc.
- Chemical spills and leaking underground or above ground storage tanks.

Priorities for 2001-2007:

Much of our core program work addresses threats at individual facilities. This list of priorities for the upcoming years attempts to cover our program work mandated by the Safe Drinking Water Act and state laws, while trying to address some of these broader threats and issues:

1. Satisfy our commitments under the Safe Drinking Water Act for surveillance and sampling of public water supply systems.
2. Provide problem assessment monitoring of private wells where needed.
3. Work with well drillers and pump installers to ensure that well construction practices are used that minimize the potential for contamination.
4. Provide water system and groundwater-related I&E activities to citizens and water well contractors regarding proper well abandonment, wellhead and source water protection, and nutrient and pest management.
5. Conduct data gathering under the Source Water Assessment Program to be used in vulnerability assessments for the Public Water Supply Program.

References:

- *The State of the Natural Resources*, Department of Natural Resources publication, 2000.
- *Groundwater: Protecting Wisconsin's Buried Treasure*, Department of Natural Resources publication, 1999
- Department of Natural Resources Strategic Plan, 1999
-

Fisheries

Program Goals:

Goal I. Making People Our Strength: People, organizations and officials work together to provide Wisconsin with healthy, sustainable ecosystems. In partnership with all publics we find innovative ways

to set priorities, accomplish tasks and evaluate successes to keep Wisconsin in the forefront of environmental quality and science-based management.

Strategies:

- Provide fisheries information to enhance public relations and education.

Goal II. Sustaining Ecosystems: The state's ecosystems are balanced and diverse. They are protected, managed and used through sound decisions that reflect long-term considerations for a healthy environment and a sustainable economy.

Strategies:

- Maintain quality recreational sport fisheries and healthy aquatic communities.
- Protect fishery habitat through water regulations (Chapter 30+31 Wis. Stats.), (NR107) Aquatic Plant Mgt. (APM) and land acquisition.
- Restore and enhance lake and stream habitat through science based techniques in partnership with user/landowner groups.
- Monitor habitat, water quality and biotic indices on lakes and streams over time.

Goal IV. Providing Outdoor Recreation: Our citizens and visitors enjoy outdoor recreation and have access to a full range of nature-based outdoor recreational opportunities.

Strategies:

- Establish a joint lands/waters access program to assure adequate acquisition, maintenance and development of public access/fishing piers, and boat ramps.

Authority and Funding Sources:

The Department's authority to manage fish and wildlife are found in State Statute 29.011 and 29.014. There are more specific authorizations throughout chapters 29 and 23. Administrative rules affecting fishing are found in NR 20-26. Additional authorizations are found in NR 10 through NR 27 and NR 45. Chapters 30 and 31 of Wis. statutes and Administrative Rules NR 102 and 107 protect aquatic habitat and water quality.

Funding comes largely from the sale of fishing and hunting licenses including the trout stamp that specifically supports trout stream habitat enhancement. Also a federal excise tax on fishing equipment and boats and motors (Federal Aid in Sport Fish Restoration) which is allocated back to states for fish management and public access purposes.

Description of Core Work:

- Fisheries Surveys
 - Fish community composition
 - Abundance estimates
 - Evaluate management strategies, regulations, stocking, and habitat improvement
 - Age/growth, size structure
 - Habitat evaluation
 - Harvest estimates
- Fish habitat improvement/protection
 - In-stream trout habitat structures and beaver control

- Lake habitat improvement (cribs, tree drops, spawning reefs, lake aeration etc.)
- Habitat protection/restoration through regulatory and voluntary programs
- Sensitive Area designations
- Acquisition (Wild Lakes, Northern Rivers, critical habitat areas)
- Dam removals
- Fish Stocking
 - Enhance angling opportunities by put and take or put and grow stocking into habitats which may not otherwise support a sustainable sport fish population for that species.
 - Re-establish self-sustaining fish communities lost to winterkill or prior environmental degradation.
 - Re-introduce rare or endangered species back into historical habitats.
- Monitoring
 - Long term biota, water quality and habitat monitoring on lakes, wadable and non-wadable streams.
 - Fish contaminant sampling.
- Treaty Monitoring
 - Assist the Treaty Unit with population estimates and creel surveys in the ceded territory.
- Public/External Relations
 - Inquiries from general public
 - Organized public groups (angling organizations, Lake Associations, etc.)
 - School children and teacher training programs
 - Conservation Congress
 - Governmental (legislators, local government, tribes, U.S.F.S., DOT, External Partner Team)
- Fish Community Manipulation
 - Stocking/field transfers/mechanical removal
 - Angling regulation development and implementation
 - Chemical reclamation
- Permitting/Regulatory Activities
 - Review Water Regulatory and Aquatic Plant Management permits (site inspections, recommend grant, denial or special conditions)
 - Review scientific collector applications
- Administrative Activities
 - Biennial and special project planning/budget development
 - Equipment procurement and maintenance
 - Hire/train/direct LTE staff
 - Maintain professional competence (training, professional societies)
 - Provide/receive cross program training to promote better understanding among all water and land program staff.
 - Some building and facility maintenance
- Hatchery program
 - Three major state fish hatcheries are located within the St. Croix Basin raising both cool and cold water species as part of a state wide production plan.

Governor Thompson Hatchery at Spooner in Washburn County is a cool water facility, hatching roughly 12 to 15 million walleye, 4 million muskie, and 500,000 northern pike annually. Up to 100,000,000 sucker fry are also hatched for muskie forage.

Some fry are stocked directly to public water but most are held for rearing to fingerling size or distributed to other rearing stations across the state. Fingerling production at Gov. Thompson is about 1.8 to 2.5 million walleye, 30,000 to 80,000 muskie and 30,000 northern pike.

Osceola Fish Hatchery near Osceola in Polk County is a cold water facility for rainbow trout. 3200 brood stock are maintained for gametes to produce 400,000 fingerlings. About 85,000 are reared to catchable size here annually and remaining fingerlings are distributed to other rearing stations or stocked directly into public water.

St. Croix Falls Hatchery at St. Croix Falls in Polk County is a cold water facility for brook and brown trout. Approximately 1300 brood fish of each species are maintained for gametes to produce 775,000 brown trout and 125,000 brook trout fingerlings. Sixty thousand brown and 38,000 brook trout are reared to catchable size here annually. The remaining fingerlings are distributed to other rearing stations or stocked into public waters.

Resource Concerns

- The proximity of the St. Croix Basin to the Minneapolis/St. Paul metro area creates substantially more development pressures and conflicting resource demands than the relatively low resident population would. Development pressure on lakes and streams for second homes, condominiums, marinas, camp grounds, etc. is insatiable. Unlike other parts of northern Wisconsin, public ownership of riparian frontage, especially on lakes, is rare here. Habitat destruction, overuse, and related water quality problems similar to heavily populated southeastern Wisconsin are coming rapidly to the northwest.
- Recent and imminent introductions of exotic and out of place endemic species threaten ecological balance and the very existence of many native species at all trophic levels. Rusty crayfish and Eurasian milfoil have gotten footholds and are expanding. Zebra mussels occupy the lower reaches of the basin with round Gobi following close behind. Fresh water drum (endemic to lower river basin) invaded the upper Basin above St. Croix Falls and greatly increased its abundance and range in recent decades. The growing list of exotic species and their expanding range may prove to be an insurmountable obstacle to maintaining healthy natural aquatic systems. Affective tools to deal with “species pollution” are still nonexistent.
- Loss/degradation of critical fisheries spawning and nursery habitat on developed and developing lakes and rivers.
- A general decline in natural walleye and sturgeon reproduction in many native waters with little understanding as yet to causes or solutions.
- We still have very incomplete knowledge of the effective use of fish stocking as a management tool in terms of genetics, stocking rates, fingerling size, etc.
- Uncertain/changing funding priorities at state and federal level result in the inability to plan for and provide scientific management, protection, maintenance and enhancement of sport fisheries and aquatic habitat in a timely fashion at a Basin level.

- Fishing pressure coupled with increasingly efficient fishing equipment technologies is a serious threat to maintaining quality sport fish populations. Regulations needed to maintain quality fisheries and balanced predator prey relationships are often viewed as too restrictive or too complicated to be implemented.
- Declining youth involvement will reduce future participation in fishing and further separate society from a full understanding of the appropriate use and conservation of natural resources.
- Lack of basic biological, physical or chemical characteristics on a few hundred small (<50 acres) glacial pothole lakes that are rapidly being developed.
- Increases in the popularity of all types of water based recreation are driving anglers off the more popular waters.
- Fishery regulations need simplification where appropriate.

Priorities for 2001-2007

Recommend, implement and evaluate traditional fish management techniques like habitat enhancement, stocking and angling regulations on individual waters. This entails conducting investigative fish surveys as well as informing the public and encouraging their participation in mgt. activities, including to help set appropriate social/biological mgt. objectives for public waters. This priority will be met through implementation of “A Fisheries, Wildlife and Habitat Management Plan for Wisconsin 2001-2007” sections as follows:

I.B.6, To increase available information for sport fish including muskellunge, walleye, bass, salmon and trout to inform anglers about the status of management of their fisheries resources through on-line and printed information services.

II.A.3, Identify and protect critical habitat in the GMU through Basin planning and monitoring processes in concert with citizens and partners. (Lake sensitive area identification, WHRA, and Northwest Sands Landscape Plan are examples of St. Croix Basin habitat protection initiatives.)

II.B.2.6, Identify critical habitat sites in the Basin for stream bank protection or in-stream habitat restoration to enhance sport fisheries.

II.B.3.3, Develop criteria to identify any recommendations to protect existing self-sustained fisheries.

- Protect fish and aquatic habitat through existing regulatory authority, acquisition, education programs and identification of aquatic sensitive areas with recommended best management practices for consideration by riparian owners and local zoning authorities. Sections II.A.3, II.B.2.6, and II.B.3.3 as described above address implementation of this priority objective.
- Long term trend monitoring of lakes and streams for water quality, habitat, invertebrate and fish community indices as part of a statewide effort to provide a broad biological base to evaluate how present and future management and land use will affect aquatic systems.
- The Willow and Kinnickinnic River sub-Basins are cold water resources of statewide importance. They are experiencing the most intensive urbanization pressures within the basin. In order to minimize some of the unavoidable consequences of population growth, Fish and Habitat as well as

Lands staff need to place extra emphasis on finishing acquisition within the project boundaries on the Kinnickinnic. Also modification or removal of dams within these watersheds need to be considered to improve fisheries and water quality. This priority objective can be addressed through implementation of sections II.A.3, II.B.2.6, and II.B.3.3 of “A Fisheries, Wildlife, and Habitat Management Plan for Wisconsin 2001- 2007”, as described.

- Develop a Lake Sturgeon Management and Restoration Plan for the Upper St. Croix River (above St. Croix Falls) in conjunction with the National Park Service, St. Croix Tribe and the State of Minnesota and the Northwest Sands Planning Committee and others. The purpose of the Plan would be to return sturgeon to their former abundance and range where possible. Identification of critical habitats and existing migration patterns and barriers, development of stocking and natural reproduction enhancement strategies which preserve genetic integrity and population monitoring would all be addressed. A project proposal has been submitted and approved for funding this priority, and implementation of sections II.A.3, II.B.2.6, IIB.3.3 as described and II.C.1.2.2 which allows field managers to identify restoration opportunities within the Basin.
- Acquire land for public access/boat landings on the following priority lakes; Sand Bar, Ellison, and Hammil Lakes in Bayfield County; Bass (Wascott township) and Snake Lakes in Douglas County; Webb and Ham Lakes in Burnett County; Pine Lake in Polk County and McClain Lake in Washburn. DNR fisheries and lands personnel are to actively seek out willing sellers of suitable property on these waters. Even with a concerted effort over a long period of time, success is uncertain. Other waters also have no or inadequate public access. Access sites on these will be acquired as opportunities arise for direct purchase or through partnership arrangements with local units of government.
- Expand youth and youth leader/teacher education and fishing pier development programs that builds ecological awareness and encourages youth entrance into sport fishing.
- Maintain basin staff training and equipment purchase and maintenance needs.

Establish a seasonal LTE crew to gather the base line data on water chemistries, morphometry and fish communities on the small water bodies that were missed in the state’s surface water inventory program of the 60’s and 70’s. Implementation of sections I.B.6, II.A.3, and II.B.3.3. of “A Fisheries, Wildlife and Habitat Management Plan for Wisconsin 2001-2007” as previously described will begin addressing this priority need.

Aquatic Habitat Protection

Program Goals:

Goal II. Sustaining Ecosystems: The state's ecosystems are balanced and diverse. They are protected, managed and used through sound decisions that reflect long-term considerations for a healthy environment and a sustainable economy.

Goal III. Protecting Public Health and Safety: Our lands, surface waters, groundwater and air are safe for humans and other living things that depend upon them. People are protected by natural resources laws in their livelihoods and recreation.

Authority and Funding Sources:

Chapters 30 (waterway regulations), 31 (dam regulations), Sections 23.32 (wetlands mapping), 281.31 (shoreland zoning), 87.30 (floodplain zoning).

Funding comes from a variety of sources (GPR, permit fees, segregated, and federal funds) in the Fisheries and Watershed programs.

Description of our core work:**Waterways and Wetlands**

The Waterways and Wetlands Permit and Regulatory Program helps protect your water rights as well as public safety by ensuring adequate planning and design of projects affecting navigable public waters, shorelands, and wetlands. Permit and plan approvals may be required for individual water projects. Site visits with landowners, in conjunction with other local governmental agencies are arranged to learn site suitability for the proposed project, identify environmental impacts, and help the landowner modify the proposal if needed. Department staff assists with a number of wetland and shoreland management and protection programs, in cooperation with several other state, federal, and local agencies. In past decades, wetlands were often viewed as wastelands; useful only when drained or filled. In more recent times, wetland benefits to people and the natural community have become more widely recognized. They can store and slow runoff waters thereby reducing flood flows, provide a filtering capacity to reduce harmful nutrients to improve or preserve water quality, and provide valuable habitat for a variety of wildlife, amphibians, reptiles, birds and fish species. Wetland vegetation along a shoreline can hold soil particles and prevent shoreline erosion by reducing wave energy.

Regulatory Programs

Department staffs assist or manage a number of regulatory programs on the local, state, and federal levels. Under Chapters 30 and 31 of the Wisconsin State Statutes, the Department reviews and processes permits for activities that involve physical alteration to surface waters. Examples include construction of dams and bridges, dredging, boathouse maintenance, piers, fish cribs, stream realignments, shoreline protection, and water levels and flows.

Wetland Protection

The U.S. Corps of Engineers reviews and processes permit applications for projects located in navigable waters and wetlands under the Federal Clean Water Act. The state also approves projects in non-navigable wetlands, through the water quality certification process.

Floodplain and Shoreland Zoning

State law requires counties, cities, and villages to adopt and administer local regulations to control development along shorelands and in the floodplains. The Department provides guidance and technical assistance for these programs. Activities such as flooding, draining, ditching, tiling, excavating, building, and setbacks of buildings and structures from navigable waters, tree and shrub removal, buffer restorations, sizing of wastewater disposal systems, and the construction of structures in the floodplain. These programs are key in the protection of our surface waters.

Dam Safety

Chapter 31 of the Wisconsin State Statutes was developed to ensure that dams are safely built, operated, and maintained. In 1986, Administrative Code NR 333 was adopted to provide design and construction standards for large dams. The Water Management Engineer administers this program. Responsibilities include dam inspections to assure dam safety, plan approval of proposed repairs and modifications, oversight of dam construction, operation and maintenance, as well as removal of unsafe or abandon dams.

Resource concerns:

Direct threats:

1. Increased development pressure, especially along riparian zones, threatens valuable aquatic and terrestrial habitat.
2. Our staffing is inadequate, compromising our ability to protect habitat.
3. A less than desired frequency of dam safety inspections could affect life, health, and property should avoidable dam failures occur.

Indirect concerns:

1. Fiscal constraints may require staffing and/or service reductions.
2. Legislative changes and court decisions (state and federal) may reduce the effectiveness of our current regulations.
3. A change of local political climates may erode some of the gains made in local zoning ordinances.

Priorities for 2001-2007:

Much of our core program work involves the protection of the shoreland and shoreline areas along our waterways either through regulation or education. The priorities for the upcoming years will focus on protecting these critical habitat areas.

1. Continue to work with local government, citizens and lake organizations to encourage and educate on the values of a healthy shoreland buffer area.
2. Provide technical assistance to local governments, citizens, and lake groups to encourage and implement shoreland restoration initiatives.

References:

- *Department of Natural Resources Strategic Plan, 1999*
- *A Strategic Plan for the Water Regulation and Zoning Program, WDNR, 1993*

Watershed Management

I. Watershed Management Program

Program Goals:

Goal II. Sustaining Ecosystems: The state's ecosystems are balanced and diverse. They are protected, managed and used through sound decisions that reflect long-term considerations for a healthy environment and a sustainable economy.

Strategy: To improve and sustain a high water quality in Wisconsin's surface waters, monitor and maintain diverse and healthy aquatic ecosystems.

Authority and Funding Sources:

The Department's authority to protect surface waters quality is grounded in the Federal Clean Water Act and Chapters NR 102, 103, 104 and 105 WI Administrative Code pursuant to s.281.15 (2)(b) State Statutes. These chapters in general describe the water quality standards necessary to protect the public rights and interests, health and welfare and the present and prospective uses of all waters of the state including; water supplies, propagation of fish and other aquatic life, use by wild and domestic animals, recreational purposes, preservation of natural flora and fauna, agricultural, commercial, industrial and other uses. Appendix D lists the impaired Waters (303d) in the St. Croix Basin which do not meet water quality standards according to the Federal Clean Water Act.

Funds to run the Water Resources Program are derived from EPA through 106 and 319 grants and through the state from general program revenue dollars.

Surface Water Monitoring Programs:

A new statewide "baseline" biological monitoring program was initiated in 1999. This program is intended to provide adequate water resource information to assess the current condition or status of the waterbody, whether it is meeting its potential biological use and if not, what factors are preventing the use from being attained. Baseline monitoring has been initiated in lakes and wadeable streams. Wadeable stream monitoring includes fish surveys (game and non-game species), macroinvertebrates (aquatic insects), water chemistry, streamflow measurements, and habitat assessments.

Lake monitoring includes several strategies to assess lake conditions in the Basin. The WDNR is currently developing statewide strategies to assess the status and trends of lake ecosystem health. The goal of this effort is to assess all lakes greater than 100 acres in size that also have public access. Publicly accessible lakes that are less than 100 acres in size will also be assessed, but at a lower level of intensity.

Monitoring may include biological and physical conditions and water chemistry. Aquatic plants, fish, bottom-dwelling invertebrates, land use practices in the watershed, weather, and physical setting and historical data are collected.

Aquatic Plant Management Program:

This program regulates the use of chemical treatments to abate nuisances caused by excessive aquatic plant growth. The objective of the permit procedure is to preserve the ecological benefits of lake plant communities, including fish and wildlife habitat, erosion prevention, and water quality maintenance. The program also promotes alternative methods of control and appreciation of the benefits of aquatic plants. Quantitative aquatic plant surveys provide information that is used for fish habitat improvement, protection of sensitive wildlife areas, aquatic plant management, and water resource regulations.

Description of Core Work:

Aquatic habitat improvement/protection

- Habitat protection through regulatory, monitoring and voluntary

- programs
 - Sensitive area designations
 - Endangered resources monitoring
 - Exotics
- Monitoring
 - Long-term trend and ambient water quality monitoring at fixed stations on lakes, wadable and non-wadable streams
 - Fresh water mussel surveys
 - Benthic community analysis
 - Sediment sampling
 - Stream classifications for TMDL regulations
 - Nutrient Analysis and modeling
 - Non-point source monitoring
- Public/External Relations
 - Represent WDNR on the St. Croix Interagency Water Resource Planning Committee
 - Inquiries from general public
 - Organized public groups (Lake Associations, Chemical Applicators, etc.)
 - School children and teacher training programs
 - Governmental (legislators, local government, tribes, U.S.F.S., DOT, External Partner Team)
- Permitting/Regulatory Activities
 - Review Water Regulatory applications (site inspections, recommend grant, denial or special conditions)
 - Designate aquatic plant sensitive areas
 - Review herbicide treatment applications for aquatic plant control
 - Expert testimony in contested case hearings
 - Review/write appropriate sections of Environmental Impact Statements or Assessments
 - Weed harvester consulting
- Administrative Activities
 - Biennial and special project planning/budget development
 - Equipment procurement and maintenance
 - Hire/train/direct LTE staff
 - Maintain professional competence (training, professional societies)
 - Provide/receive cross program training to promote better understanding among all water and land program staff

This program is staffed by a team of specialists, biologists, engineers, program experts, and program assistants. Water Resource Management staff work assignments range from entire water basins to specific counties.

Resource Concerns:

Includes issues compiled from various sources such as local biologists, engineers, planning committees, partnerships and citizens.

- Development pressures leading to a decline in water quality.

- Agricultural impacts.
- Contamination from point source and non-point source discharges of phosphorous, ammonia, nitrogen, suspended solids and fecal coliform bacteria.
- Decline in populations of Rare and Endangered species found in the St. Croix Basin.
- Decline in the overall status of the natural ecosystems found in the St. Croix Basin.
- Increase and/or introduction of exotic species in our aquatic ecosystems.
- Decline of littoral zone habitats.

Priorities for 2001-2007:

1. Continue to meet our commitments to provide a high quality of surface water in the St. Croix Basin.
2. Work with partnerships and citizens to ensure that the Department is always aware of the public interest.
3. Provide a source of information for Departmental staff, citizens and other interested parties through involved monitoring and management of the surface waters.
4. Continue to address foreseeable concerns that may impact the surface waters of the state.

References:

- *Department of Natural Resources – Strategic Plan*, 1999
- *The St. Croix – Water Quality Management Plan*, February 1994
- *Minnesota Watermarks – Gauging the Flow of Progress 2000-2010*, 2000

II. Priority Watershed Program

Program Goals:

Goal II. Sustaining Ecosystems: The state's ecosystems are balanced and diverse. They are protected, managed and used through sound decisions that reflect long-term considerations for a healthy environment and a sustainable economy.

Strategies:

- Prevent and clean up nonpoint water pollution using voluntary or enforcement methods, land acquisition, and easements. Protect and restore aquatic habitat.
- Assist local governments in preventing and eliminating nonpoint water pollution.

Goal III. Protecting Public Health and Safety: Our lands, surface waters, groundwater and air are safe for humans and other living things that depend upon them. People are protected by natural resources laws in their livelihoods and recreation.

Strategies:

- Achieve water quality that protects the health of all living things, and meet or exceed state and federal standards for all pollutants.

Authority and Funding Sources:

The Wisconsin Department of Natural Resources' Nonpoint Source Pollution Abatement Program gets its authority for protecting the surface waters and groundwater of the state from nonpoint source pollution

from Section 281.65 of the Wisconsin State Statutes. The Priority Watershed Program is administered by Chapter NR 120 of the Wisconsin Administrative Code.

The nonpoint pollution program is currently undergoing a restructuring. The priority watershed program is being gradually replaced by short-term grants that will address specific projects rather than focusing on entire watersheds.

Funding for the program comes from a variety of sources. Under the old priority watershed program, counties and municipalities received money in two forms: local assistance grants or LAG money from DNR that paid for staff and office expenses, and Nonpoint Source Grants, which are given to the local units of government for the installation of best management practices (BMP's). Money for the reimbursement of Cost Share Agreements (ACRA, or Anticipated Cost Share Reimbursement Amount) and money for Targeted Runoff Management (TRiM Grants) comes from bonds. As of the year 2000, the Department of Agriculture, Trade, and Consumer Protection (DATCP) is responsible for getting the LAG money to the counties. The DNR receives money in S319 grants from the federal EPA in order to staff the nonpoint program.

Description of Core Work:

The NPS program is currently being redesigned. Chapter NR 120 is being rewritten and expanded, and therefore, the methods of controlling nonpoint pollution are changing.

The last priority watershed project (Big Wood Lake, Burnett Co.) was recently approved by the Land and Water Conservation Board on October 3, 2000. The goal of these priority watershed programs is to improve and protect the water quality of surface waters and groundwater within the watershed. Priority watershed programs are largely (critical sites are regulatory) voluntary. They encourage landowners to control nonpoint pollution on their properties through cost sharing of BMP's. These plans have both rural and urban components.

Water quality is both protected and improved by controlling polluted runoff from both agricultural and non-agricultural practices. For the rural component, BMP's can include barnyard runoff management, manure storage systems, animal lot abandonment, well abandonment, nutrient and pest management, grassed waterways, critical area stabilization, clean water diversions, and a variety of other BMP's. Non agricultural BMP's include road and construction site erosion control, wetland restoration, and lakeshore buffer restoration. Urban practices include street sweeping, stormwater detention basins and a variety of other urban BMP's.

As priority watershed programs end, they will be replaced by Targeted Runoff Management projects (TRM). These are projects that are more specific in nature and may last up to three years. They are scored on a competitive basis, based on the amount of pollutant control they will achieve, the degree of impairment of the location and other factors associated with local unit of government implementation activities.

Two nonpoint source coordinators are located in the northern region; one at Rhinelander, and one at Spooner. The coordinators administer and oversee the priority watershed programs and will also assist with the TRiM grants. They also provide nonpoint source pollution advice to counties that are implementing their land and water plans.

Resource Concerns:

This section was compiled from conversations with department staff, county conservationists, county zoning officials, priority watershed project managers, and concerned citizens. County land and water resource plans also identified threats to the resource.

Direct Threats to Water Quality

Surface Water:

- Increased shoreland development and increased polluted runoff associated with impervious surfaces, lawn fertilizations, and removal of native vegetation.
- Poor agricultural practices, i.e. manure management (runoff from frozen fields, barnyards that drain to a surface water, livestock in rivers/lakes), soil erosion, and improper application of fertilizer and pesticides.
- Soil loss from erosion on cropland and construction site erosion.
- Erosion from road construction and maintenance.
- Cranberry operations.
- Polluted stormwater runoff.
- Loss of wetlands.

Groundwater:

- Improper well abandonment.
- Leaking underground storage tanks.
- Failing septic systems.
- Loss of wetlands.
- Leaking manure storage pits.

Indirect Threats to Water Quality

- Small dairy farms are going out of business and are being replaced with either large operations or row cropping.
- Urban sprawl (Polk Co.).
- Lack of adequate zoning to protect against the negative effects of development; new zoning laws came too late; not enough enforcement of zoning laws.
- Lack of enforcement of county regulations (ordinances, zoning laws, manure management).
- Lack of education on the part of the public; not enough effort by the DNR and counties to educate people.
- Lack of information on the current state of the resource; no data, or no well organized accessible data.

Priorities for 2001-2007:

- 1) Continue our commitment to fund the existing priority watershed projects that are in the implementation phase:

Table C: Priority Watersheds in the St. Croix River Basin

Priority Watershed	Year Selected	Ending Year
Yellow River, Barron County	1989	2004
Big Wood Lake, Burnett County	1996	2009
Upper St. Croix Lake and Eau Claire River, Douglas County	1997	2008
Balsam Branch Creek, Polk County	1994	2006
Horse Creek, Polk County	1999	2009

Osceola Creek, Polk County	1995	2007
St. Croix County Lakes Cluster, St. Croix County	1994	2008
Kinnickinnic River, St. Croix and Pierce Counties	1995	2009

Yellow River, Barron County: Began in 1989 and ends December 2004. Sign up ended in 1996, but the project was extended for implementation because of the limited NPS budget (the county needed more time to install the BMP's for the projects they already had signed up). This watershed project started before the routine identification of critical sites, so technically they don't have any. However, the county is working on at least one new barnyard adjacent to the Red Cedar River that almost certainly would have been a critical site. The LCD has only one position dedicated to the watershed and could use more help were funding made available.

Big Wood Lake, Burnett County: This project was approved by the Land and Water Conservation Board on October 3, 2000. Planning began in 1996 and the implementation phase will end in December of 2009. The county is currently in the process of notifying the landowners of the critical sites.

Upper St. Croix Lake and Eau Claire River, Douglas County: This watershed project is in its 5th year; sign up goes until December 2008. The previous watershed manager left the position in March and a new manager started in May. There are three to four new shoreline habitat restoration projects pending. The project suffered storm damage last summer from flooding and some of the projects were re-planted this past spring. A few prospective participants pulled out of the project due to delays.

Balsam Branch Creek, Polk County: This project is in its 8th year of implementation and is scheduled to go until 2006. This project also has a new manager, who came on board in June. Polk County has more support staff for the watershed project and therefore the turnover did not adversely affect their ability to process cost share agreements.

Urbanization and changing agricultural practices are challenges for this and the county's other two priority watershed projects. Small dairy farms are being sold and either split up for development of rural homes or they are converting to cash grain farming or row cropping. Phosphorus reductions do not look as dramatic on some of the projects because farmers are beginning to remove land from CRP or changing hay fields to row crops. Nutrient management agreements are "holding the line" and resulting in little or no increase of phosphorus and soil erosion (but not much of a decrease, either).

Polk County's version of WINHUSLE was not Y2K compliant and therefore they are now using their own model that is probably more accurate in predicting loads. It takes distances from surface water, slope, and internally drained fields into consideration and tends to have lower baseline levels of phosphorus loading. As a result, phosphorus reductions tend to look smaller than in previous estimates using WINHUSLE.

Horse Creek, Polk County: The Horse Creek priority watershed was selected in 1995 and the plan was approved in 1999. This project will end in 2009. The watershed is predominantly rural with crop fields and dairy farms. Residential development is scattered except for the many high-value recreational lakes that are ringed with lakeshore residential development. The watershed's proximity to the Minneapolis/St. Paul metropolitan area makes it a target for continued development pressure.

The Horse Creek Priority Watershed Management Plan examines the source of non-point pollution in the watershed and guides the implementation of pollution control measures based on the water

resource goals and objectives. Reductions in sedimentation and phosphorus loading, as well as wetlands restoration and groundwater protection will be targeted.

Osceola Creek, Polk County: This project began in 1995 and ends in 2007.

St. Croix County Lakes Cluster, St. Croix County: The St. Croix County Lakes Cluster Priority Watershed was selected in 1994, and the plan was approved in 1997. It will be completed in 2008. The four lakes and their drainage areas that make up this project are predominantly in St. Croix County.

Bass and Perch lakes are both in the Lower Willow River Watershed. Both are designed as Outstanding Resource Waters (ORW) under NR 102. Goals for Bass and Perch Lakes are protection oriented, and include maintaining and enhancing current good water quality conditions, protecting and improving existing aquatic plant beds, shallow water and terrestrial habitat, and wetlands.

Bass Lake's 4.3 square mile watershed is a mixture of gently rolling cropland, pasture and forest. The lake is surrounded by residential development, and upland areas are being converted from agricultural to large lot residential use. Perch Lake's 0.6 square mile watershed is largely forested, with little agricultural use. Large lot residential development is rapidly occurring in the watershed. In 1996, St. Croix County purchased 80 acres, including three-fourths of a mile of shoreline on Perch Lake, for use as a county park.

By the end of 2000, the Bass Lake Watershed had achieved 110% of its barnyard phosphorus reduction goal, 189% of its upland sediment loss goal and 90% of its shoreline erosion goal. Perch Lake has planned 120% of its shoreline erosion goal and achieved 288% of its gully erosion goal.

Baldwin-Pine Lake is in the Lower Apple River Watershed. Much of the five square mile watershed is gently rolling agricultural land. Water quality is poor to very poor. The lake has a long history of sinkholes, fluctuating water levels and winterkills. However, two aeration systems were installed in 1994, and the fishery restoration has resulted in a sunfish dominated community. Almost a mile of eroding shoreline is in the process of being protected through the acquisition of a Nonpoint Source Easement. Baldwin-Pine Lake has achieved none of its barnyard phosphorus goal, 47% of its upland sediment loss goal and 140% of its shoreline erosion goal.

Squaw Lake is located in the Trout Brook Watershed. A portion of its nine square mile watershed extends into southern Polk County, and is relatively flat agricultural land intermixed with wetlands. During the 1970's and 1980's, water quality severely deteriorated. Installation of an aeration system has prevented winterkills since 1989. Squaw Lake has been designated as a 303d list impaired water due to excessive nutrient loads. A Total Maximum Daily Load (TMDL) Plan for water quality improvement was completed for Squaw Lake in 2000. The plan calls for a moderate improvement in water quality through control of agricultural runoff and internal recycling of nutrients. Squaw Lake has achieved none of its barnyard phosphorus goal, 825% of its upland sediment reduction goal and none of its shoreline erosion goal (although this is a very small source). WDNR, 1997 *Nonpoint Source Control Plan for the St. Croix County Lakes Cluster Priority Watershed Project*.

Kinnickinnic River Priority Watershed Project: The Kinnickinnic River Priority Watershed was selected in 1995 and the plan was approved in 1999. It is scheduled to be completed in 2009. The watershed encompasses 174 square miles and is located in St. Croix and Pierce Counties. Gently rolling agricultural land comprises most of the watershed, and dairy farming and cash cropping are the primary enterprises. The Kinnickinnic River is a high quality COLD Class I trout fishery that originates in agricultural lands in St. Croix County, flows through the City of River Falls and drains

to the St. Croix River. In rural areas, the river is primarily impacted by agricultural runoff, flashy stream flows and sedimentation. As the stream flows through River Falls, it is also thermally impacted by urban stormwater runoff and two shallow impoundments. The Kinnickinnic River, excepting the reach within the City of River Falls, has been designated as an Outstanding Resource Water (ORW) by the State of Wisconsin. Brook and brown trout dominate the cold water fishery in this watershed.

By the end of 2000, the upland sediment reduction and streambank erosion reduction goals for the project had been met, and 37% of the barnyard phosphorus reduction goal had been met. No reduction in sediment from dry runs had yet been reported, although sediment from dry runs is very small compared to sediment from other uplands.

Urban - The village of Osceola purchased a street sweeper for the watershed that does an excellent job of removing the fine pollutants from the streets. The DOT leased it for one year as part of a test study to determine its effectiveness for cleaning the interstate. They were supposed to have returned it to the village in April, but it was damaged and now is being repaired in St. Louis, MO. The village is currently using their old sweeper, but there is concern that it is not as effective in removing the pollutants.

Rural - The village is also expanding its industrial park on farmland that had nutrient and pest management agreements; these will be paid up before development begins. Development of farmland for residential use continues to be a problem here. Osceola is close enough to Minneapolis/St. Paul to experience urban sprawl. The critical sites in this watershed have disappeared due to attrition; farms are being sold and the new owners are no longer raising livestock or dairying.

- 2) Seek ways of assisting local, northern communities in acquiring TRiM grants to control NPS pollution.
- 3) Continue to work with the counties providing technical assistance so they can meet their NPS objectives outlined in their land and water plans. Assist them in outlining nonpoint pollution goals when they update these plans.

References:

- *Wisconsin NPS Priority Watershed Implementation Manual*, WDNR, 1998.
- *Department of Natural Resources Strategic Plan*, 1999
- *Chapter NR 120 Nonpoint Source Pollution Abatement Program*, WI Administrative Code.
- *County Land and Water Resource Management Plans:*

<i>Ashland/Bayfield</i>	<i>Price</i>
<i>Barron</i>	<i>Sawyer</i>
<i>Burnett</i>	<i>Washburn</i>
<i>Polk</i>	<i>Iron</i>

III. Wastewater and Stormwater

Program Goals:

Goal II: Sustaining Ecosystems: The state's ecosystems are balanced and diverse. They are protected, managed and used through sound decisions that reflect long-term considerations for a healthy environment and a sustainable economy.

Strategies:

- Use planning and management methods that address the connection between pollution problems on land, in water and in air.
- Prevent, and, where practical, clean up pollution of soil, water and air to ensure the stability of ecosystems, using innovative cost-effective voluntary or enforcement methods.
- Meet, and where possible, exceed the public vision for an environment that supports sustained economic, ecological, aesthetic, recreational, agricultural, and other uses.
- Determine and plan for long-term state water quality and quantity needs to ensure ecosystem integrity, sustained development and economic stability.
- Provide the tools, information and incentives needed for governments, people and their organizations to make environmentally sound land use and land management decisions that protect ecosystems and improve quality of life.

Goal III: Protecting Public Health and Safety: Our lands, surface waters, groundwater and air are safe for humans and other living things that depend upon them. People are protected by natural resources laws in their livelihoods and recreation.

Strategies:

- Achieve soil, surface water, groundwater, and air quality levels that protect the health of all living things, and meet (or achieve better than) state and federal standards for all pollutants.
- Develop comprehensive monitoring and risk assessment capabilities for selecting appropriate environmental controls for soils, water and air.
- Identify the most significant threats to soil, water and air quality, implement policies and practices to reduce or eliminate those threats, and restore contaminated soils, water, and air to levels that protect the health of all living things.
- Ensure that the state's fish and game are safe for human and wildlife consumption.
- Use education and enforcement to protect public health, safety, and the environment.

Authority and Funding Sources:

The Department gets its authority to protect groundwater quality, surface water quality and public health under the federal Clean Water Act and Chapters 281, 283, and 160 of the Wisconsin Statutes. Under the authority granted by these laws, Wisconsin Administrative Codes pertaining to point and non-point source pollution control were written. These codes specify the classification of surface waters, effluent limitations and standards required for discharge to a water of the state, wastewater permitting procedures, construction requirements for wastewater treatment facilities, pretreatment standards for industries discharging to municipal treatment plants, and requirements for animal waste and stormwater management.

Funds to run our program come from general program revenue dollars, pollution environmental fees paid by dischargers, and federal grant dollars through the Clean Water Act funding.

Resource Concerns:

Excessive sedimentation and runoff from land practices, especially agriculture, are the single most significant factor affecting water quality in the St. Croix Basin. Nutrients, especially phosphorus, are carried with soil particles into surface water where algae growth is fueled by these excess nutrients and result in algae blooms and degraded water quality. Treated wastewater from municipal and industrial

wastewater plants are another significant source of dissolved reactive phosphorus, especially during the summer growing season. Both these “non-point” and “point” sources of pollution need to be controlled through effective regulations and program strategies.

Description of core work:

Municipal and Industrial Discharge Permits. The WDNR regulates municipal and industrial facilities discharging wastewater to surface water or groundwater through the Wisconsin Pollutant Discharge Elimination System (WPDES) Permit Program. (See Appendix C for a complete listing of permitted wastewater facilities located in the St. Croix Basin). Specific permits are written for many facilities, and these permits regulate activities such as effluent discharges to surface and groundwater, biosolids (sludge) treatment and disposal practices, facility upgrades, pretreatment facilities, toxic discharges, and compliance maintenance practices. DNR also issues general permits for smaller activities with innocuous discharges such as pit or trench dewatering, noncontact cooling water, gravel pit washing, swimming pool drainage, asphalt and concrete operations.

Compliance Inspection and Enforcement. DNR basin engineers and specialists enforce the regulations through a variety of compliance activities. They conduct on-site inspections and collect samples of effluent to verify compliance with WPDES permit limits. They review facility discharge monitoring reports, groundwater turnaround documents, and sludge reports. DNR employees also review and comment on Compliance Maintenance Annual Reports that describe key operating measures of municipal treatment plants and discuss these results with the communities. DNR staff follow up on identified violations with repeat inspections, letters of non-compliance, and permit modifications to require necessary treatment plant corrections. Staff initiate legal proceedings for serious repeated violations which are not resolved in a timely matter to DNR and Department of Justice attorneys.

Stormwater. Industrial and transportation facilities that conduct activities that can contaminate stormwater from their operations are required to obtain WPDES Stormwater Permits. Examples include auto salvage yards, coal, salt and other mineral storage facilities, sawmills, steam electric generating plants, and vehicle maintenance facilities among others. These facilities must prepare and implement stormwater pollution prevention plans which include good housekeeping practices and use of best management practices (BMP's) to control the contamination of rainfall and snowmelt and impacts contaminated stormwater creates when it reaches rivers, streams and lakes.

Large construction projects that disturb more than five acres of soil are required to obtain construction site erosion control permits. The site owners are required to develop and implement a site specific BMP to minimize the amount of sediment that runs off a construction site with stormwater. Owners use a wide variety of best management practices to minimize the amount of runoff and keep the soil from eroding and causing sedimentation in surface waters.

Animal Waste Management. Large animal operations are required to obtain DNR WPDES permits if they exceed a 1000 animal unit herd size. Farmers have to follow approved construction standards for manure storage facilities so they do not leak and contaminate groundwater. DNR also requires farmers to develop approved manure management plans to safely land spread their manure to cropland so its nutrients, especially nitrogen and phosphorus, can be utilized by the crops and not run off to enter surface water. Controls are also imposed on runoff from livestock yards and animal feed storage facilities.

DNR also enforces minimum standards on all live stock operations regardless of their size. These are called the four prohibitions. No livestock operation can stack manure within 300 feet of a stream or 1000 feet of a lake unless they use an approved manure storage pad. No barnyard is allowed to run off where the overflow contaminates any water of the state, including wetlands. No manure pit may overflow. Livestock cannot be allowed to graze the banks of streams or lakes in numbers such that a sod cover is not

maintained. DNR along with county staff use a variety of tools including grant funding and enforcement to require operators to correct these violations.

Operation and Maintenance Assistance. DNR field staff provide technical support to assist plant operators and communities with all aspects of plant operation, including process control, problem investigation, operational changes, and facility expansion feasibility studies.

Laboratory and Operator Certification. Wastewater treatment plants, which perform testing to monitor their effluent, are required to be certified by DNR to ensure their sampling methods, sample analysis, quality control, and records meet acceptable standards. All operators must also be certified to operate a treatment plant. They must complete and pass written exams and have a minimum amount of operating experience depending on the plant size and equipment complexity. Operators must complete six hours of continuing education every year.

Septage and Holding Tank Wastewater. WDNR regulates the disposal of septage and holding tank wastewater in Wisconsin. This wastewater is generated from on-site septic tanks and holding tanks. DNR staff certifies haulers, review and approve land-spreading sites, respond to complaints and make routine inspections for compliance.

Priorities for 2001 – 2007:

Municipalities and industries need to maintain and update their wastewater treatment plants to keep up with growth in their sewer service area. Many of these plants were built in the mid-eighties and now are nearing their original 20-year design life. Several have already been replaced and the rest will need to be replaced as well.

As communities and industries expand their wastewater treatment, they need to construct nutrient control facilities for phosphorus and ammonia where water quality studies show this treatment can contribute to improved water quality.

Expand the non-point source program to ensure municipalities, industries, and commercial establishments install and maintain up-to-date best management practices for maximizing stormwater infiltration to reduce the delivery of stormwater to water resources and for keeping stormwater from being contaminated.

Require all dischargers who land apply wastewater to cropland to reduce the application of phosphorus and keep soil phosphorus levels from increasing. This also includes farmers who land apply manure.

Expand the lake and stream data assessment collection to include an annual assessment of phosphorus delivery to water resources. Quantify key indicators of non-point source pollution by individual watersheds so the progress meeting nutrient control goals can be measured.

Encourage townships to plan storage facilities for septage and holding tank wastewater in their towns so winter land-spreading is eliminated. The stored wastewater would be treated and land-spread during the summer.

Division of Land

The Department's Division of Lands is comprised of four bureaus that engage in management and regulatory activities to maintain and enhance the diversity of species and habitats of plants and animals that occupy the Wisconsin landscape. These bureaus are Endangered Resources, Facilities and Lands, Parks and Recreation, and Wildlife Management. Within each Bureau are sections that are assigned responsibilities to address specific land or wildlife based management issues as prescribed by State Statutes, Administrative Codes and Department policy. Following are program statements that will address Division of Land issues as related to identified needs within the St. Croix Basin, and where staffing resources are assigned to implement planned work activities. It should be noted that the wildlife management emphasis in this section of the plan relates to the scope of program within this basin, and is due to large public ownership of state lands where Department staff has management responsibility. Department staff provides cooperative management assistance to counties that also have large acreage in public ownership.

Photo courtesy of Gary Dunsmoor, WDNR.



Wildlife Management

Program Goals:

Goal II. Sustaining Ecosystems: To protect and enhance our natural resources: our air, land, and water; our wildlife, fish and forests the ecosystems that sustain all life and to provide a healthy, sustainable environment.

Strategies:

- Continue to maintain and manage wetlands and grasslands on state land.
- Encourage wetland and prairie grassland restoration on private and other public lands through continued partnerships with natural resource agencies and organizations.
- Maintain and restore Barrens communities through partnerships with multiple landowners. Implement the Northwest Sands Integrated Ecosystem Management Plan in concert with signatory partners (see Map 15, "Ecological Landscapes" in GMU/Basin Ecology Section).
- Continue efforts in protecting Endangered and Threatened Species, by screening all department projects to assure sound management. Continue to educate the public on the advantages of protecting species for the welfare of the ecosystem and the public benefit at large.
- Support efforts to effectively manage species that can cause animal damage by liberal hunting and trapping seasons. Continue management assistance to counties to reduce animal damage.
- Continue to manage public forestlands for a diversity of habitat types. Encourage private landowners to manage their forestlands for the benefit of wildlife species.

Goal IV. Providing Outdoor Recreation: To provide a healthy, sustainable environment and a full range of outdoor opportunities. To ensure the right of all people to use and enjoy these resources in their work and leisure.

Strategies:

- Continue to ensure access to public lands, and waters for people of all ages by managing state wildlife areas with the diversity of public needs in mind.
- Manage to provide a diverse wildlife population in sufficient numbers to support quality hunting and trapping.
- Promote responsible hunting and trapping to assure these traditions are preserved for future generations.
- Promote hunting and other outdoor recreational opportunities for youth, disabled and nontraditional participants.

Authority and Funding Sources:

Authority for wildlife management programs is often found in policy set by the Natural Resources Board. Hunting and Trapping authorization is found in State Statute (Chapters 10 and 29).

Funding sources for wildlife management is through revenue generated from the sale of hunting licenses and stamps. In addition funds are generated by an 11% excise tax on all hunting equipment in the form of Pittman Robertson (PR) dollars. Some General Purpose Revenue (GPR) tax dollars are also allocated to specific projects from time to time such as an additional allotment to pay for crop damages. Secondary funding comes from federal grants such as the North American Wetlands Conservation Act Grant (NAWCA) and private money from our many important partners such as Ducks Unlimited (DU), Whitetails Unlimited, Turkey Federation, etc.

Description of our core work:

The Bureau of Wildlife Management (WM) oversees a complex network of programs that incorporate state, federal and local initiatives primarily directed toward wildlife habitat management, restoration and enhancement.

In the Basin WM is charged with the acquisition, development and maintenance of State Wildlife Areas. Our Basin also has a very active Private Lands component and County Forest Assistance program.

Below is a listing of some of the diverse activities that our Wildlife Management employees conduct:

1. Recommend updates in hunting and trapping regulations.
2. Prepare property needs analysis and species management plans for their areas.
3. Monitor wildlife through population and habitat surveys.
4. Prepare annual game harvest recommendations for deer, bear, turkey and Canada geese.
5. Provide technical advice and assistance to landowners in the development or implementation of wildlife enhancement programs. These include Farm Bill grassland planting and prescribed burning.
6. Conduct educational programs to encourage responsible land management techniques and practices.
7. Negotiate with landowners and assist acquisition by handling most aspects (except appraisal) of the purchase within approved state acquisition plans.
8. Process and administer permits for state licensed game farms, shooting preserves, fur farms, dog training and wildlife rehabilitation.
9. Establish and implement Habitat Rehabilitation Areas under the Stewardship Fund. Guide citizen advisory committees formed to address the many social and biological issues presented by such important projects.

10. Write or review environmental impact statements to assure adequacy of portions relating to wildlife or their habitat.
11. Assist other DNR functions with investigation of wildlife-related issues or enforcement actions. Collaborate with DNR planning efforts in Fishery Area Plans to assure sound habitat management.
12. Promote and assist county level USDA agencies with the implementation of wildlife friendly programs such as the federal Conservation Reserve and Wetland Reserve Programs. Recommend cost-share practices and rates for these programs.
13. Provide technical input and program review for federal and state programs that directly affect wildlife resources. Examples are the Farm Bill and the Managed Forest Law.
14. Plan, bid, and solicit funding for wetland restoration on private, U.S. Fish and Wildlife Service, County Forest and state-owned land.

Resource Concerns:

This plan includes a "Basin Resource Threats List" compiled from contacts with our Basin Partner Team, meetings with the public, and interviews with staff. Threats were also identified in County Land and Water Resource Plans and recent Department publications. Here are the major threats, and objectives and recommendations to resolve those threats for the Wildlife Management program.

1. Loss of Grassland Habitat
 - A. Implement recommendations for this community found in the Biodiversity Report and the Management for Grasslands Birds document.
 - ◆ Support the Western Prairie Habitat Restoration Area (WPHRA) efforts in acquiring 15,000 additional acres of easement or title to grassland habitat.
 - ◆ Manage, enhance and restore native vegetation on existing and newly acquired prairie remnants as refuge for flora, fauna and ecological processes.
 - B. Continue to manage grassland habitat on state lands.
 - C. Continue to promote and use prescribed burning on private and public land as an important tool for perpetuating prairie habitat
 - D. Continue to work with partner agencies to increase the use of incentive programs such as Conservation Reserve Program (CRP) to increase and improve grasslands in private ownership.
2. Loss of Wetland Habitat
 - A. Restore degraded wetland complexes on public and private lands to recapture ecosystem function and value including the enhancement of migratory waterfowl habitat.
 - B. Continue to work with our partners such as Ducks Unlimited (DU), Wisconsin Waterfowlers Association (WWA) etc., to develop and manage wetland complexes critical to migratory waterfowl.
 - C. Continue to develop and maintain flowages and other wetland habitat on state lands.
3. Loss of Barrens Habitat
 - A. Maintain and restore barrens communities through partnerships with multiple landowners.
 - B. Implement the Northwest Sands Integrated Ecosystem Management Plan in concert with the signatory partners.
 - C. Continue to educate staff on the necessity of prescribed burning and the safe use of this technique in maintaining barrens communities.

- D. Continue to educate the public on the importance of prescribed burning in ecological management.
 - E. Continue to manage all public properties with barrens habitat and look for opportunities to increase the size of these areas.
4. Changes in Forest Habitat in the Northern Forests
- A. Maintain full spectrum of forest ecosystems with a range of successional stages, patch sizes, geographic distribution, involving public and private partners.
 - B. Complete Master Plans for state owned land, and County Forest 10–year plans as scheduled during this six–year period.
 - C. Encourage the maintenance of large, contiguous forest for ecological, economic, and social benefits.
 - D. Continue to incorporate wildlife needs through private tax law plans.
 - E. Encourage the maintenance of critical shade intolerant forest communities such as jack pine, aspen and oak, and managed openings for the benefit of numerous wildlife species.
 - F. Support in the 2050 Lands Acquisition Study the opportunity to keep quasi-public industrial forestlands available for continued public use.
 - G. Discourage forest fragmentation by supporting enrollment of private forestlands into the Managed Forest Law (MFL).
5. Protecting Endangered and Threatened Species
- A. Continue trumpeter swan, wolf, eagle, and osprey population monitoring and productivity surveys.
 - B. Cooperate with efforts in the recovery of Whooping Cranes.
 - C. Recognize the importance of the Karner Blue Butterfly and Blandings Turtle in the barrens ecosystem.
 - D. Implement the Karner Blue Butterfly Management Plan on state properties.
 - E. Continue to screen all projects in and around state lands for occurrence of endangered, threatened and special concern species and communities.
 - F. Continue efforts to control purple loosestrife and other harmful invasive species in the wetland communities on state lands.
6. Controlling Animal Damage
- A. Continue to manage funding and assistance to counties in reducing animal damage.
 - B. Continue to partner with Animal and Plant Health Inspection Service (APHIS) to reduce animal nuisance and damage problems for private citizens.
 - C. Support efforts to effectively manage beaver, bear, deer, geese, and turkeys at socially acceptable levels, through liberal hunting and trapping seasons.
7. Shoreline habitat protection and restoration
- A. Support strategies to provide shoreline habitat protection and restoration.
 - B. Continue support in controlling non-point water pollution through “Forestry Best Management Practices (BMP’s) for Water Quality.”

Priorities for 2001 - 2007

The southern part of the St. Croix Basin is characterized by rich prairie soil interspersed with an abundance of shallow, prairie pothole lakes and wetlands. Our focus in this part of the basin is toward wetland and prairie/grassland management on both public and private lands.

The northern half of the Basin is much more forested and has a higher percentage of public lands. Much of the northern part is characterized by droughty, sandy soils. Our focus in this part of the Basin is more on public lands management for forest wildlife species, and on managing a globally rare habitat type known as Pine Barrens. Pine Barrens are prairie or savannah habitats that occur on sandy soils due to frequent fires. Once covering millions of acres of Wisconsin, they now are found on less than 50,000 acres.

Highlights of the wildlife management program in the St. Croix Basin, for the next planning period will center on the priorities mentioned below:

1. Western Prairie Habitat Restoration Area (WPHRA): Our newest project in the Basin became a reality in 1999 when the Governor approved the WPHRA, at a signing in Polk County. This project authorizes the Department to restore 20,000 acres of native prairie in portions of Polk and St. Croix Counties through fee title acquisition by the Department as well as working with partners such as the U.S. Fish and Wildlife Service to restore prairie on lands they manage. Heavy emphasis will be on additional land acquisition during the six year planning period. This project will benefit species such as pheasants, bobolinks, meadowlarks, badger, blue-winged teal and mallards. Although this projects landscape falls within the St. Croix Basin, the management of these project lands will be completed by the staff located in the Department of Natural Resources office in Baldwin, WI.
2. Private Landowner Assistance: A major focus throughout the southern half of the basin has been toward helping landowners restore previously drained wetlands, and restore uplands fields to native prairies. While being a direct benefit to these landowners, it has also contributed to providing key habitat for a variety of wildlife species of interest to the general public. We intend to continue these restoration efforts for the duration of the planning period.
3. Manage State Properties for Wildlife: The Basin is blessed with an abundance of state wildlife areas, fishery areas, and one state forest. Wildlife habitat management is done on all of these properties and is the primary focus on all the wildlife areas. (See Map 3, "St. Croix Basin Public Land" in GMU/Basin Ecology Section). The major wildlife areas in the Basin that will continue to be managed for a diversity of wildlife species and public use are:

New Auburn	Crex Meadows
Joel Marsh	McKenzie Creek
Douglas County	Amsterdam Sloughs
Namekagon Barrens	Fish Lake
Loon Lake	Danbury Rice Beds

4. Endangered Species Management: While most of the funding for wildlife management comes from the sale of hunting and fishing licenses plus an 11% tax on hunting equipment, non-hunted species are always given special attention. Key species in our Basin that are currently increasing in numbers are trumpeter swans, Karner Blue butterflies, bald eagles, ospreys, and gray wolves.
5. Cooperative Work on other Public Lands: County Forests make up the largest acreage of public land in our Basin (see Map 3, "St. Croix Basin Public Land" in GMU/Basin Ecology Section). A long

partnership between the Department and the counties has existed on the management of county forests. Wildlife management will continue to foster this relationship to insure healthy wildlife populations and compatible recreation activities on these public lands.

6. Wildlife Education: Wildlife management devotes a significant amount of time to educating the public on sound principles of wildlife management as well as the responsible use of natural resources. A highlight in this endeavor over the next planning period will be the construction of the Crex Meadows Wildlife Education Center. This project has largely been funded through private donations to the non-profit Friends of Crex organization. They were able to raise over one million dollars for this education center.

References:

- *Strategic Plan*, WDNR, 1999
- *Fisheries, Wildlife and Habitat management Plan for Wisconsin 2001 through 2007*, WDNR

Northwest Sands Integrated Ecosystem Management Plan

Program Goals:

Overall Goal: Working in a public forum with a team of partners, prepare and implement a plan that addresses the needs of plant and animal communities found within the Northwest Sands Ecological Landscape on both land and water while meeting the social and economic needs of the human community.

Goal 1. Making People Our Strength: People, organizations and officials work together to provide Wisconsin with healthy, sustainable ecosystems. In partnership with all publics we find innovative ways to set priorities, accomplish tasks and evaluate successes to keep Wisconsin in the forefront of environmental quality and science-based management.

Strategies:

- Involve individuals, businesses, governments, tribes and organizations in managing natural resources and protecting human and wildlife health, by sharing knowledge, responsibility, decision-making, recognition, and costs.
- Provide and promote information and education to help achieve Wisconsin's environmental and natural resources goals and vision.

Goal 2. Sustaining Ecosystems: The state's ecosystems are balanced and diverse. They are protected, managed and used through sound decisions that reflect long-term considerations for a healthy environment and a sustainable economy.

Strategies:

- Use planning and management methods that maintain, protect and enhance productive and sustainable forests, fisheries, wildlife and other harvestable natural resources.
- Maintain and restore terrestrial, wetland and aquatic ecosystems that support diverse flora and fauna, and that provide landscape scale ecosystem functions from flood control to groundwater recharge.
- Protect and, where practical, reestablish endangered resources and habitats and work to eradicate or control harmful, non-native species.

- Protect ecosystems through acquisition of land, easements or other innovative strategies.
- Meet, and where possible exceed, the public vision for an environment that supports sustained economic, ecological, aesthetic, recreational, agricultural, and other uses.
- Determine and plan for long-term state water quality and quantity needs to ensure ecosystem integrity, sustained development and economic stability.
- Provide the tools, information and incentives needed for governments, people and their organizations to make environmentally sound land use and land management decisions that protect ecosystems and improve quality of life.

Goal III. Protecting Public Health and Safety: Our lands, surface waters, groundwater and air are safe for humans and other living things that depend upon them. People are protected by natural resources laws in their livelihoods and recreation.

Strategies:

- Protect people and their communities from flooding, dam failures, forest and wild fires, and the release of hazardous substances.
- Use education and enforcement to protect public health, safety, and the environment.

Goal IV. Providing Outdoor Recreation: Our citizens and visitors enjoy outdoor recreation and have access to a full range of nature-based outdoor recreational opportunities.

Strategies:

- Ensure access to public lands, waters and recreational opportunities for people of all ages and abilities.
- Develop and maintain a high-quality system of state forests, parks, trails, educational facilities, boating access sites, natural areas, and fish and wildlife properties that support a variety of nature-based recreational pursuits.
- Manage to provide diverse, healthy plant, fish and wildlife populations in sufficient numbers to support quality hunting, fishing, trapping and gathering.
- Provide leadership in long-term planning for statewide outdoor recreational needs and in resolving outdoor recreational conflicts.
- Promote and improve recreational opportunities on state waters and on public and private lands through partnerships with people, governments, tribes, businesses and other organizations.

Authority and Funding Sources:

The plan was funded through EPA Grant #CS826214-01-1 titled "Public/Private Partnership Project For the Pine Barrens Ecosystem in Northwestern Wisconsin - DNR".

The plan will be implemented by the Department and numerous partners. It calls for significant actions on the part of county governments, particularly zoning and county forests, industrial forests and the U.S. Forest Service. Internally primary implementation occurs within the forestry, fisheries, wildlife, endangered resources, and ground and surface water quality programs.

Funding within the Department will rely upon segregated fisheries, wildlife and forestry funds; federal DJ and PR funds; and GPR funding.

Description of core work:

The Plan establishes six goals, nearly two dozen strategies and recommends nearly 100 specific activities. Economic and social concerns are addressed as well as perpetuating the ecological functions that make this area so important. Both terrestrial and aquatic issues are addressed.

Core focus areas for the Department are numerous and varied.

- Managing much of the area for jack pine and red pine timber products will remain a key focus.
- Managing significant acreage as permanent or transitional brush prairie or Pine Barrens was the catalyst for the planning effort and will be a key area to work with our partners on accomplishing.
- Exploring opportunities to restore oak savanna and pine savanna needs to begin.
- Insuring that large blocks of industrial forest are protected from "privatization" through the Land Legacy planning effort is a priority.
- Protecting water quality in general, and wild shorelines and rivers specifically are critical elements of the Plan upon which Department personnel will focus.

Resource Concerns:

The Northwest Sands Area contains numerous lakes and rivers. Over the past ten or fifteen years the shorelines of lakes have been largely developed as seasonal or year-round residences. Few truly wild lakes remain except those in public ownership. Recently developers have switched focus to the area's river systems and those not in public ownership are seriously threatened with over-development.

Pine Barrens have been identified as a globally threatened community. Remnants of the once extensive community in Wisconsin remain primarily on state managed properties within the Northwest Sands. The relatively low acreages and long distances between remnants threaten long-term existence of many barrens species such as the sharp-tailed grouse.

Industrial forestlands continue to be sold with increasing frequency in Wisconsin. Significant industrial forestland exists within the Northwest Sands and is very important locally as a timber resource and recreational use area.

Private, non-industrial forestlands are increasingly being subdivided for private recreational use or housing development. This is increasing the threat of catastrophic wild fire, and decreasing the opportunity to manage these lands for timber production and healthy wildlife populations.

The human population is growing rapidly primarily due to immigration of seasonal and retirement residents from more urbanized areas. This is threatening the more traditional resource uses of hunting, fishing, trapping and timber harvest. These uses are being replaced by off-road motorized recreation, golfing, nature observation, shopping and eating in restaurants as primary recreational pursuits. Resistance to traditional resource uses is growing.

Priorities for 2001-2007:

Protection of remaining wild lakeshore and rivers will be a very high priority. Unprotected, developable lakeshore and river corridors will be largely developed by 2007.

Working with other major land managers such as the managers of county forests and industrial forests to modify timber management practices in order to increase the amount of barrens habitat will be a very high priority. The opportunity to manage both barrens and a commercial pinery on the same lands exists.

Working out the details and reaching agreement on a strategy should be accomplished early in this planning cycle.

Identifying critical industrial forestlands and developing strategies to keep them quasi-public should be accomplished by the end of 2001. The Land Legacy Program appears to be a potential solution.

Working closely with counties and townships to develop acceptable land use plans through the Smart Growth initiative will be the highest priority work item we can accomplish during the six-year period.

References:

Northwest Sands Area Management Plan, 2000

Department of Natural Resources Strategic Plan, 1999

Division of Forestry

The Division of Forestry, a recently created division within the Department of Natural Resources, has a single Bureau of Forestry. Within the bureau are five (5) sections assigned responsibilities to address specific forestry related management issues as prescribed by State Statutes, Administrative Codes and Department policy. The sections manage and protect the forestry resource and associated benefits on public and private forestlands throughout the State.

The following program statement will address the Division of Forestry issues as related to identified needs within the St. Croix Basin where staffing resources are assigned to implement planned work activities. The large public ownership of State and County forest lands within the Basin accounts for significant investment of staff time in the management of the forest resource for the associated benefits. **Photo courtesy of Ken Jonas, WDNR.**



Forest Management

Program Goals:

Goal I. Making People Our Strength: To work with people to understand each other's views and to carry out the public will. And in this partnership consider the future and generations to follow.

Strategies:

- Provide additional staff to service requests in Polk County.
- Give high priority to delivery of initial contacts to landowners that have never been exposed to forestry advice.
- Improve service to non- industrial private landowners by exploring new concepts in forest cooperatives.
- Improve our existing cooperative partnerships with private sector foresters.
- In public awareness, focus efforts of DNR foresters on contacts with landowners.

- Continue to build the strong partnerships between the Department of Natural Resources and the County Forests by providing current levels of technical assistance.
- Continue to build strong partnerships with volunteer fire departments to enable quick response to wild land fires, and to provide for the protection of both the environment and private property.
- In cooperation with others, manage public and private lands for a diversity of forest communities based upon the lands capability as indicated through Land Type Associations (LTA's) and Forest Habitat Classifications.

Goal II. Sustaining Ecosystems: To protect and enhance our natural resources: air, land, and water, our wildlife, fish and forests ecosystems that sustain all life, to provide a healthy, sustainable environment.

Strategies:

- Maintain and restore Barrens communities through partnerships with multiple landowners. Implement the Northwest Sands Integrated Ecosystem Management Plan in concert with signatory partners.
- Continue efforts in protecting Endangered and Threatened Species, by screening all department projects to assure sound management. Continue to educate the public on the advantages of protecting species for the welfare of the ecosystem and the public benefit at large.

Goal III. Protecting Public Health and Safety: To provide a healthy, sustainable environment and a full range of outdoor opportunities. To ensure the right of all people to use and enjoy these resources in their work and leisure.

- Protect people and their communities from forest and wild fires.
- Use education and enforcement to provide fire and forest use safety, and to protect the environment.

Goal IV. Providing Outdoor Recreation: To provide a healthy, sustainable environment and a full range of outdoor opportunities. To ensure the right of all people to use and enjoy these resources in their work and leisure.

Strategies:

- Continue to develop and maintain the Governor Knowles State Forest to ensure a variety of nature-based recreational pursuits.
- Assist counties with recreational pursuits on County lands

Authority and Funding Sources:

Authorization for County Forest activities is found in Statute Chapter 28.11. Private Forestry authorization is found in Chapter 26.35 and Chapter 77; and Natural Resources Codes (NR Codes) 1.21, 46, and 47.80. State Forest authorization is found in Chapter 28 and in NR Codes 1.24 and 1.42. Fire Control authorization is found in Chapter 26 and NR Code 30

Funding for the forestry program is primarily through a property tax with a fixed mill rate (forestry mill tax statute 70.58). Some other sources of revenue are from recreation use fees, sale of forest products, sale of nursery stock, forest tax law payments and other miscellaneous fees and sales.

Description of our Core Work:

The Bureau of Forestry oversees a complex network of programs directed toward forest management and protection. The St. Croix Basin is 48% forested with the southern counties having a greater percentage of open land and the northern counties being more heavily public owned forested. The northern counties have a majority of ownership in the County Forest and Industrial Forest, while the southern counties are largely owned by non-industrial private landowners.

Below are key functional areas within the Forestry Program.

County Forestry

1. The Department of Natural Resources provides to the counties technical assistance in; planning, timber sale design and administration, reforestation, environmental assessments, environmental and endangered resource protection and forest inventory. The County Forest program includes a long-standing county/state partnership in Douglas, Bayfield, Washburn, Burnett, Polk and Barron counties.
2. The Department provides financial assistance to the counties in the form of interest free loans and grants. Each county forest has a liaison that coordinates all Basin contact with each county.

Private Forestry

1. Service Foresters are assigned to each county. They provide on the ground assistance to non-industrial landowners in the form of management plans, reforestation plans, tax law administration, and insect and disease advice.
2. Each service forester is responsible to administer federal and state cost-sharing programs to aid in forest landowner needs.
3. Service foresters provide education programs for landowners, resource managers, local units of government, schools and the general public.

Forest Fire Management

Fire management personnel in the Basin work in the following areas:

1. Fire prevention – Staff conduct fire prevention programs for children and adult groups, and cooperate with media to promote fire prevention. Personnel use signs, permits and other innovative ways to gain cooperation in prevention efforts.
2. Fire Detection – Staff use the most effective mix of fire towers, aircraft, and public reporting to detect forest fires as quickly as possible
3. Fire Pre-Suppression – Personnel maintain a highly effective fire management staff and infrastructure to carry out all necessary tasks in the fire management program. Staff works with all cooperators and partners to maximize program effectiveness. Fire management staff complete all planning needed to suppress fires and minimize losses, while maintaining an effective law enforcement program.
4. Fire Suppression – DNR forestry staff responds quickly using tractor and plows as the prime tool for initial and extended attack to control wildland fires. Forestry staff works closely with volunteer fire departments that protect homes, recreational properties and businesses. The

National Park Service, the U.S. Forest Service, Bureau of Indian Affairs, Industrial Forests and County Forests are partners in fire suppression activities

State Forest Management

The Department of Natural Resources develops and maintains the resources on the Governor Knowles State Forest using principles of sustained yield forestry. This forest serves as a resource protection zone for the St. Croix River.

Resource Concerns:

This plan included a section on "Basin Resource Threats List" compiled from contacts with our Basin Partner team, meetings with the public, and interviews with staff. Threats were also identified in county land and water resource plans and recent Department publications. Here are the major threats and objectives, and recommendations to resolve those threats for the Forestry program.

1. Changes in Forest Habitat in the Northern Forests
 - A. Maintain full spectrum of forest ecosystems with a range of successional stages, patch sizes, geographic distribution, involving public and private partners.
 - B. Complete Master Plans for state owned land, and County Forest 10-year plans as scheduled during this six-year period. Consider opportunities presented in the "Northwest Sands Integrated Management Plan" in the planning process.
 - C. Encourage the maintenance of large, contiguous forest for ecological, economic, and social benefits.
 - D. Continue to incorporate wildlife needs through private tax law plans.
 - E. Encourage the maintenance of critical shade intolerant forest communities such as jack pine, aspen and oak, and managed openings for the benefit of numerous wildlife species.
 - F. Support in the 2050 Lands Acquisition Study the opportunity to keep quasi-public industrial forestlands available for continued public use.
 - G. Discourage forest fragmentation by supporting enrollment of private forestlands into the Managed Forest Law (MFL).
2. Loss of Barrens Habitat
 - A. Maintain and restore barrens communities through partnerships with multiple landowners.
 - B. Implement the Northwest Sands Integrated Ecosystem Management Plan in concert with the signatory partners.
 - C. Continue to educate staff on the necessity of prescribed burning and the safe use of this technique in maintaining barrens communities.
 - D. Continue to educate the public on the importance of prescribed burning in ecological management.
 - E. Continue to manage all public properties with barrens habitat and look for opportunities to increase the size of these areas.
3. Protecting Endangered and Threatened Species
 - A. Recognize the importance of the Karner Blue Butterfly and Blandings Turtle in the barrens ecosystem.
 - B. Implement the Karner Blue Butterfly Management Plan on state properties.

- C. Continue to screen all projects in and around state lands for occurrence of endangered, threatened and special concern species and communities.
 - D. Continue efforts to control purple loosestrife and other harmful invasive species in the wetland communities on state lands.
4. Shoreline habitat protection and restoration
- A. Support strategies to provide shoreline habitat protection and restoration.
 - B. Continue support in controlling non-point water pollution through “Forestry Best Management Practices (BMP’s) for Water Quality.”

Priorities for 2001 – 2007:

- Continue to protect people and their communities from forest and wildfires
- Provide one additional service forester position in Polk County
- Continue to service the increasing Managed Forest Law applications and required Stewardship Plans.
- Complete Master Plans for the state owned land and County Forest Ten Year Comprehensive plans for County Forests.
- Encourage the maintenance of shade intolerant forest communities across the landscape.
- Continue to develop the Governor Knowles State Forest to ensure a variety and quality of nature-based recreational pursuits.
- Continue to build strong partnerships with volunteer fire departments.

References:

Department of Natural Resources Strategic Plan, 1999

LAKES REPORT

All lakes are important as valuable natural resources, but the DNR's ability to manage all of them is limited. Because of the large number of lakes in the St. Croix drainage basin, it is necessary to limit the number of lakes included in this plan. Therefore, only the named lakes 10 acres or larger and the unnamed lakes 25 acres or larger are included in this plan and are listed in the following tables and narratives. The St. Croix Basin is an area blessed with an abundance of aquatic resources. The exclusion of small lakes for consideration in this plan still left over 800 lakes to be evaluated. These waters range from 34 lakes that are larger than 500 acres to 258 lakes less than 25 acres.

Lakes are listed by sub-watershed in the lakes tables. The Lake Table Quick Reference sheet lists the abbreviations and codes that are used in the management and information columns.

The lack of an updated and current lake water quality database is a serious problem confronting lake managers. Many of the lakes in the Basin lack sufficient information to determine the current trophic status and adequately plan future lake management activities. A lack of adequate information and a database are persistent and pervasive problems that thwart effective prioritization and lakes management. Without a concerted effort, these needs will continue, and without new data collected according to modern water quality standards and methods, effective and efficient management of these lakes will be hampered.

Polk County is perhaps the most glaring example of this information deficiency. This county was one of the first in the state to be surveyed under the Surface Water Inventory Program. Many lakes were missed in this initial effort at lake inventory and important data such as pH and secchi depths were not collected at all for this county. The information that is in the Polk County report was collected primarily during 1960 so is at least 40 years out of date. An update of the Polk County surface waters report would be a high priority need for this Basin.

Dozens of lakes in this basin have been sampled for fish tissue contamination with mercury and thirty lakes are the current Health Advisory listing for mercury concentrations above the 0.5 ppm threshold level as established by the Wisconsin Division of Health. These lakes are identified in the following tables and are listed in the publication, "Important Health Information for People Eating Fish in Wisconsin Waters". The collection of fish for the analysis of contaminants that may pose possible human health risks is an ongoing monitoring priority in this Basin and throughout the state of Wisconsin. Persons interested in the current status of a possible advisory listing for any individual lake are recommended to consult the above mentioned booklet, which is published annually by the Wisconsin Division of Health and Wisconsin Department of Natural Resources.

Water quality assessment monitoring will continue to be a high priority activity for many lakes in the St. Croix Basin. This monitoring may be to update existing data or establish baseline trophic information where none exists. This monitoring may be conducted by DNR staff under the Basin assessment program, a response water quality survey, or the relatively new comprehensive lake monitoring program. Water quality monitoring can also be conducted by lake groups or other sponsors under the Lake Management Planning Grant Program. Lake districts, lake associations, tribes, counties, cities, villages or towns can apply for Lake Planning Grants to fund collection of information on the quality of water in lakes, or assess the condition of the surrounding lands and their impact on the water quality of the lake.

Many lakes in this Basin area are becoming heavily developed and the pressure for lakeshore property leads to conflicts between proposed shoreline alterations or applications for chemical aquatic plan treatment and the need to protect the remaining critical natural resources areas. The designation of

aquatic plant community “sensitive areas” is one method of alleviating these conflicts and protecting sensitive lake areas. The conduct of comprehensive multi-program lake surveys to designate these areas will continue to be a high priority activity for St. Croix Basin lakes.

The participation of lake management groups and other eligible sponsors in the Self-Help Monitoring Program, the Lakes Planning Grants Program, and the Lakes Protection Grants Program will continue to be ranked as a priority activity for many St. Croix Basin Lakes. These activities are open to almost any lake and applications for these activities will be evaluated on a case-by-case basis. A ranking process will be used to evaluate applications.

The Wisconsin Lakes Partnership Program helps ensure healthy and diverse lake ecosystems while considering the needs of society. Partnership priorities include adopt-a-lake and youth and adult education, aquatic plant management and protection, lake leadership training, lake organizational and technical assistance, lake planning and lake protection and classification grants, recreational boating aids and boating safety, self-help citizen lake monitoring, shoreland and water regulation and zoning, and wetland and watershed management.

Three groups form the core of this partnership. The DNR supplies technical and financial assistance and regulatory authority. The University of Wisconsin Extension builds linkages between stakeholders and provides educational materials and programs. The Wisconsin Association of Lakes (WAL) provides a united voice for lake organizations around the state and plays a vital role in all areas of partnership activities. Lake organizations, property owners, and local governments provide the political will and hard work to accomplish watershed restoration and lake protection.

Appendix A. Rare Species or Natural Communities in the Main Stem St. Croix River

Scientific Name	Common Name	Status U.S.	State	Location
<u>Fish</u>				
<u>Acipenser fulvescens</u>	Lake Sturgeon	C2	RULE	St. Croix River St. Croix R. - Kettle Rapids St. Croix R. - Osceola St. Croix R. - Riverside St. Croix R. - St. Croix Falls St. Croix R. - St. Croix Falls Dam
<u>Anguilla rostrata</u>	American Eel	NONE		St. Croix River
<u>Alosa chrysochloris</u>	Skipjack Herring	END		St. Croix River St. Croix R. - Hudson
<u>Hiodon alosoides</u>	Goldeye	END		St. Croix River St. Croix R. - Stillwater
<u>Notropis amnis</u>	Pallid Shiner	END		St. Croix River
<u>Notropis anogenus</u>	Pugnose Shiner	THR		St. Croix River
<u>Notropis texanus</u>	Weed Shiner	NONE		St. Croix River St. Croix R. - Hudson St. Croix R. - Osceola St. Croix R. - Stillwater
<u>Macrhybopsis aestivalis</u>	Speckled Chub	THR		St. Croix River St. Croix R. - Osceola
<u>Opsopoeodus emiliae</u>	Pugnose Minnow	NONE		St. Croix River St. Croix R. - Island
<u>Cycleptus elongatus</u>	Blue Sucker	C2	THR	St. Croix River St. Croix R. - Kettle Rapids St. Croix R. - Osceola St. Croix R. - St. Croix Falls
<u>Moxostoma carinatum</u>	River Redhorse	THR		St. Croix River
<u>Moxostoma valenciennesi</u>	Greater Redhorse	THR		St. Croix River St. Croix R. - Osceola
<u>Ammocrypta asprella</u>	Crystal Darter	C2	END	St. Croix River St. Croix R. - Apple River Mouth St. Croix R. - Osceola
<u>Ammocrypta clara</u>	Western Sand Darter	NONE		St. Croix River St. Croix R. - Island St. Croix R. - Osceola St. Croix R. - St. Croix Falls St. Croix R. - Stillwater
<u>Etheostoma asprigene</u>	Mud Darter	NONE		St. Croix R. - Stillwater
<u>Percina evides</u>	Gilt Darter	THR		St. Croix River
<u>Dragonflies</u>				
<u>Gomphurus lineatifrons</u>	Splendid Clubtail	NONE		St. Croix R. - CTH O Boat Landing
<u>Gomphurus ventricosus</u>	Skillet Clubtail	NONE		St. Croix R.-CTH O Boat Landing
<u>Hylogomphus viridifrons</u>	Green-Faced Clubtail	NONE		St. Croix R.-CTH O Boat Landing
<u>Ophiogomphus howei</u>	Pygmy Snaketail	C2	END	St. Croix R.-CTH O Boat Landing St. Croix R.-Narrows
<u>Stylurus amnicola</u>	Riverine Clubtail	NONE		St. Croix R.-CTH O Boat Landing
<u>Stylurus spinicers</u>	Arrow Clubtail	NONE		St. Croix R.-Narrows
<u>Mussels</u>				
<u>Alasmodonta marginata</u>	Elktoe		RULE	St. Croix R.-Greenburg Island St. Croix R.-St. Croix Islands
<u>Anodonta imbecillis</u>	Paper Pondshell		RULE	St. Croix R.-St. Croix Islands
<u>Cumberlandia monodonta</u>	Spectacle Case	C2	END	St. Croix R.-Interstate Park St. Croix R.-Marine on St. Croix St. Croix R.-Goose Creek
<u>Cyclonaias tuberculata</u>	Purple Wartyback		END	St. Croix R.-Hudson Islands
<u>Ellipsaria lineolata</u>	Butterfly		END	St. Croix R.-Osceola St. Croix R.-St. Croix Islands
<u>Epioblasma triquetra</u>	Snuffbox	C2	END	St. Croix R.-Interstate Park St. Croix R.-Osceola St. Croix R.-Hudson Islands
<u>Fusconaia ebena</u>	Ebony Shell		END	St. Croix R.-Hudson Islands
<u>Lampsilis higgins</u>	Higgins' Eye	LE	END	Lake St. Croix St. Croix R.-Houlton St. Croix R.-Hudson St. Croix R.-Marine on St. Croix
<u>Pleurobema sintoxia</u>	Round Pigtoe		RULE	St. Croix R.-Chases Brook St. Croix R.-Hudson Islands St. Croix R.-St. Croix Islands

<u>Quadrula fragosa</u>	Winged Mapleleaf	LE	END	St. Croix R.-Hudson
<u>Quadrula metanevra</u>	Monkeyface		THR	St. Croix R.-Interstate Park
<u>Simpsonia ambigua</u>	Salamander Mussel	C2	THR	St. Croix R.-Folsom Lake
<u>Tritogonia verrucosa</u>	Buckhorn		THR	St. Croix R.-Osceola
				St. Croix R.-Folsom Lake
				St. Croix R.-Folsom Lake
				St. Croix R.-Greenburg Island
				St. Croix R.-North Hudson
				St. Croix R.-Osceola
				St. Croix R.-St. Croix Islands
	<u>Communities</u>			
Floodplain Forest	Floodplain Forest		NONE	St. Croix Islands
Emergent Aquatic	Emergent Aquatic		NONE	St. Croix Islands

Source: Wisconsin Natural Heritage Working List, WDNR, Bureau of Endangered Resources

Key: Scientific Name: Scientific name used by the Wisconsin Natural Heritage Inventory Program.

Common Name: Standard, contrived, or agreed upon common names.

U.S. Status: Protection category designated by the U.S. Fish and Wildlife Service indicating the biological status of a species in the United States. LE = listed endangered; LT = listed threatened; LELT = listed endangered in part of its range, threatened in a different part; PE = proposed endangered; PT = proposed threatened; PEPT = proposed endangered, threatened; C1 = candidate, proposed for listing; C2 = candidate, under review for listing; 3A = former candidate, rejected because of presumed extinction; 3B = former candidate, rejected because it's considered a synonym or hybrid; 3C = former candidate, rejected because more common or adequately protected.

WI Status: Protection category designated by the WDNR indicating the biological status of a species in Wisconsin. END = endangered; THR = threatened; RULE = protected or regulated by some other state or federal legislation or policy, e.g. migratory birds and game species; NONE = no laws regulating use; PEND = proposed endangered; PTHR = proposed threatened.

Special Concern species are species identified in the "WI Status" column as PEND, PTHR, RULE, or NONE. Special Concern species are species about which some problem of abundance or distribution is suspected but not yet proved. The main purpose of this category is to focus attention on certain species before they become threatened or endangered.

Appendix B. Lake Table Quick Reference

Kinnickinnic River Watershed Lakes (SC01)

Mercury Codes:
 R=Monitoring recommended
 X=Testing done; NO advisory
 XX=Testing done; Advisory imposed

Public Access Codes:
 BR=Boat Ramp
 BF=Barrier-free pier
 P = Barrier-free pier (wheelchair access)
 T = Walk-in trail
 R = Roadside
 W = Wilderness
 BW = Barrier-free wilderness access
 (wheelchair access)
 NW = Navigable water access to lake
 X = Some type available, but not specified

Macrophyte (Plant) codes:
 EM=Eurasian milfoil present
 EM-W=Eurasian milfoil weevil
 research underway
 PL=Purple loosestrife present

Trophic Status Index Ratings:
 Oligotrophic < 39
 Mesotrophic if between 40 and 49

Lake Name
 (Legal description included where needed for clarification)

Unique identification number used for Department records

Lake Type Codes:
 DG=Drainage
 DR=Drained
 SE=Seepage
 SP=Spring

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet) Max Mean	Lake Type	Winter Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
Bushnell Lake	St. Croix	2603100	17	12	SE	YES	R								
Casey Lake	St. Croix	2606700	28	12	SE	YES	W								
Twin Lakes	St. Croix	2598900	97		SE	YES	R	S-R		Plan-R			57-93	II INS	NUT, ALG, DO

Self-Help Monitoring Codes:
 R=Recommended
 X=Completed
 C=Currently being done
 S=Secchi Monitoring
 CH=Secchi+Chemical Monitoring
 EX=Secchi-DO Monitoring

Lake Management Organization Codes:
 Y means an organization exists
 ASSC=Lake Association
 DIST=Lake District

Lake Grant Codes:
 PLAN=Planning Grant received
 PROT=Protection Grant received
 PLAN-R=Planning Grant recommended
 PROT-R=Protection Grant recommended

Phosphorus Sensitivity Codes:
 I=Class I (more sensitive lakes)
 A=excellent water quality; most sensitive to increased loading
 B=poor water quality; less sensitive to increased loading
 Ins=insufficient data; monitoring recommended
 II=Class II (less sensitive lakes)
 A=excellent water quality; not as sensitive as Class I lakes
 B=poor water quality; low sensitivity to increased loading
 Ins=insufficient data

Comment Codes:

Sources	Causes/Stressors
AGSPR - Agricultural land spreading site HM - Hydrological modification (dam, ditching, wetland drainage) NPS - Unspecified nonpoint sources CL - Cropland erosion SB - Streambank erosion PSB - Streambank pasturing PWL - Woodlot pasturing	HAB - Habitat MAC - Undesirable macrophyte ALG - Undesirable algae growth NUT - Nutrient enrichment SED - Sedimentation TOX - General toxicity problems TURB - Turbidity DO - low dissolved oxygen ACC - Access problems

Appendix C. Lakes Tables

Kinnickinnic River Watershed Lakes (SC01)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	Lake Mgt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Kinnickinnic Pond, Lower	Pierce	2603100	15	13		DG			S-R		Plan - R Prot - R				II INS	
Kinnickinnic Pond, Upper	Pierce	2603200	18	9		DG			S-R		Plan - R Prot - R				II INS	SED
Bushnell Lake	St Croix	2606100	17	12		SE	Yes	R							I INS	
Casey Lake	St Croix	2606700	28	12		SE	Yes	W							II INS	
Twin Lakes	St Croix	2598900	97			SE	Yes	R	S-R		Plan-R			57-93	II INS	NUT, ALG, DO
Unnamed T29N R17W S03-14		2606100	12	10											I INS	

Lower Willow River Watershed Lakes (SC02)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeMgt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
St. Croix Lake		2601500	4668	60		DG		BR	S-C	R	Prot-R Plan - R			39-62	I B	NUT, NPS , MAC
Bass Lake, T30N R19W S23	St Croix	2450500	293	37		SE		BR	S-R	DIST	Plan-P Prot-R			45-51	I A	HAB, NUT
Brushy Mound Lake	St Croix	2455100	13	5		SE	Yes								II INS	
Dry Dam Lake	St Croix	2461600	28	4		SE									II INS	
Hatfield Lake	St Croix	2468200	47	9		SE	Yes	T	S-R						II INS	NUT
Little Falls Lake	St Croix	2607400	172	18	8	DG		BR, T	S-R		Plan-R Prot-R				II INS	NUT, MAC, SED, NPS
Mallalieu Lake	St Croix	2607100	270	17	5	DG		BR	S-C	ASSC					II B	NUT, ALG, MAC, NPS
New Richmond Flowage	St Croix	2608800	236	15	4	DG		BR	S-R	DIST	Plan-R Prot-R				II INS	NUT, SED
Oakridge Lake	St Croix	2486800	149												II INS	
Perch Lake	St Croix	2488300	43	63	34	SE		BR	S-R						I A	
Three Lakes	St Croix	2501400	85	5		SE	YES	R	S-R						II INS	NUT, ALG
Unnamed Lake, T30N R19W S26- 12		2504100	11	6											II INS	

Upper Willow River Watershed Lakes (SC03)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	Lake Mgt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Goose Pond	St Croix	2609100	14	2		SE		R							II INS	
Harmin Lake	St Croix	2612100	17	6		SE									II INS	
Pine Lake, T29N R17W, S01	St Croix	2489700	102	21	8	SE		BR	S-R	R	Plan-R Prot-R			59-69	II INS	NUT, ALG, DO

Lower Apple River Watershed Lakes (SC04)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Church PineLake	Polk	2616100	107	45	23	DG		BR	CH-C	DIST	Plan, Prot		PC	38-49	I A	
Lower Pine Lake	Polk	2479900	90	102	40	SE		BR	S-R					37-42	I A	
Wind Lake (Round L)	Polk	2616000	38	7		DG		T	CH-C	DIST	Plan Prot		PC	44-46	II A	
Big Lake (33-36- 18W)	Polk	2615900	259	24	17	DG		BR	CH-C	DIST	Plan Prot		PC	45-62	II B	1 Mac
Black Brook Flowage	Polk	2621900	98	23	7	DG		BR						51-67	II B	
Clear Lake (18- 32-15W)	Polk	2623500	30	26	13	SE		BR	S-R						I NS	
Lotus Lake (21- 33-18W)	Polk	2616900	246	15	7	DG	YES	BR	S-R						II NS	
Pine Lake (23-32- 18W)	Polk	2490400	82	34	10	SE		BR	S-R						I NS	
Sand Lake (2-33- 18W)	Polk	2495000	187	58	25	SE		BR	S-R	ASSC				52-61	I B	
Duck Lake (25-33- 18W)	Polk	2461900	20												I NS	
Horse Lake	Polk	2616200	228	11	6	DG		BR	S-C						II NS	
Island Lake (30- 32-16W)	Polk	2470400	65					BR							I NS	
Island Lake (5-32- 18W)	Polk	2470500	20												I NS	
King Lake (East) (5-32-16W)	Polk	2472300	49	14		SE	YES	T							II NS	
Little Horseshoe Lake (24-33-18)	Polk	2476500	30												I NS	
Paulson Lake (18- 32-17W)	Polk	2488000	26	21		SE		BR							I NS	
Pleasant Lake (5- 32-18W)	Polk	2490700	45												I NS	
Round Lake (26- 33-18W)	Polk	2616400	67	26	15	DG		BR	S-C					45-50	I NS	
Smith Lake (16- 32-17W)	Polk	2497700	20												I NS	
So. Fish Lake	Polk	2494200	75												I NS	
Swede Lake	Polk	2500500	68	32	13	SE		W	S-R						I NS	
French Lake (7- 32-15W)	Polk	2623200	15	11		DG										
Horseshoe Lake (20-33-17W)	Polk	2465600	120	8												
Mud Lake (35-33- 18W)	Polk	2615700	40	12		SE										
Rice Lake (11-32- 18W)	Polk	2615400	98	6	4	DG	YES	NW								

Lake Name	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)	Lake Type	Winter-Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
Location (T-R-S)															
Bone Lake (27-32-16W)	Polk	2454400	30	5	SE										
Cedar Lake	St Croix	2615100	1107	28			BR	S-C	Dist	Plan-R, Prot-R			35-72	1-B	NUT, ALG, HAB
King Lake (West) (6-32-16W)	Polk	2502400	43	7		YES									
Larsen Lake	Polk	2474200	21	8	SE										
Long Lake (27-32-16W)	Polk	2478100	20	3	SE										
Mansen Lake	Polk	2481000	18	12	SE		T								
No Fish Lake	Polk	2485600	56	4	SE										
Pine Lake (15-33-17W (Larch)	Polk	2490300	46	6	SE										
Surprise Lake	Polk	2500200	14	3	SE										
Apple Falls Flowage	St Croix	264200	39	40	DG		T	S-R		Plan-R Prot-R					
Riverdale Flowage	St Croix	2614600	75	20	DG		BR	S-R		Plan-R Prot-R					
Strand Lake	St Croix	2499100	21	16	SE										
Turtle Lake	St Croix	2502800	27	12											

Balsam Branch Watershed Lakes (SC05)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Balsam Lake	Polk	2620600	2054	37		SE		BR	S-C	DIST/ ASSC	PLAN PROT		PC	47-57	I A	
Deer Lake (30-34-17W)	Polk	2619400	807	46	26	DG		BR	EX-C	ASSC	PLAN PROT	XX		39-51	I A	
Half Moon Lake	Polk	2621100	579	60	25	DG		BR	CH-C	DIST/ ASSC	PLAN PROT-R			45-56	I A	
Antler Lake	Polk	2449400	101	22	9	SE		BR	S-R	DIST	PLAN			47	I INS	
Bear Trap Lake	Polk	2618100	241	25	17	DG		BR	EX-C	ASSC	PLAN PROT			53-60	II B	
Long Lake (6-34-17W)	Polk	2478200	272	17	11	SE		BR	S-C	DIST	PLAN PROT-R			43-71	II B	
Loveless Lake	Polk	2620000	141	20	15	DG		BR	CH-C	ASSC	PLAN-R			42-68	II INS	
Wapogasset Lake	Polk	2618000	1186	32	17	DG		BR	EX-C	ASSC	PLAN PROT			54-60	II B	
Wild Goose Lake	Polk	2600400	182	12	8	SE	YES	BR	S-R	ASSC	PLAN-R			65	II INS	
Badger Lake (5-33-17W)	Polk	2449600	20												I INS	
Bear Lake (6-33-17W)	Polk	2452200	155												I INS	
Joe Lake (14-33-17W)	Polk	2471300	20												I INS	
Kinney Lake (36-33-17W)	Polk	2472400	19												I INS	
Otter Lake (16-35-17W)	Polk	2621500	20												I INS	
Ox Lake (10-33-17W)	Polk	2487500	27												I INS	
Parker Lake (14-34-17W)	Polk	2487900	10	8		SE									II INS	
Round Lake (36-34-18W)	Polk	2493300	10	6		SE									I INS	
Bridget Lake (Mud Lake)	Polk	2619100	95	7	3	DG		NW						54-68	II B	
Deronda Lake (Mud L)	Polk	2617800	19	12		DG		T							II INS	
Elkins Lake	Polk	2463200	38	15		SE		W							II INS	
Little Bass Lake	Polk	2619800	21	15		SE									I INS	
Little Pine Lake (10-35-17W)	Polk	2498800	61	10												
Rice Lake (Glen ton)	Polk	2621600	128	10	3	DG	YES	BR	CH-R		PLAN-R			60-80	II B	1 NUT
Basswood Lake	Polk	2452100	22	10		SE										
Camp Douglas Lake	Polk	2456200	10	4		SE										

Lake Name	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)	Lake Type	Winter-Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
Location (T-R-S)															
East Lake (18-34-16W)	Polk	2462800	73	6	SE										
Kenabee Lake	Polk	2473200	29	7	SE										
Laurel Lake	Polk	2620800	14	6	SE										
Lost Lake (24-35-17W)	Polk	2479200	10	6	SE										
Lykens Lake	Polk	2480500	19	10	SE		T								
Twenty-Ninth Lake	Polk	2503100	29	7	SE										

Upper Apple River Watershed Lakes (SC06)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter - Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Ma c	TSl	P Sens	Comments
				Max	Mean											
Horseshoe Lake	Polk	2630100	377	57	20	SE		BR	S-C CHR	ASSC	PLAN-R			45-54	I A	
Pike Lake	Polk	2624000	159	33	14	SE		BR	S-R	DIST	PLAN			46-57	I A	
Pipe Lake	Polk	2490500	345	68	27	SE		BR	CH-C	ASSC	PLAN	XX		35-45	I A	
Pipe Lake (North)	Polk	2485700	55	37		SE		NW	S-C CHR	ASSC	PLAN				I NS	
Apple River Flowage	Polk	2624200	639	18	6	DG		BR	CH-C	DIST	PLAN			43-60	I D	
Big Blake Lake	Polk	2627000	226	14	9	DG		BR	S-R	DIST	PLAN		PC	50-74	I B	1 MAC
Big Round Lake	Polk	2627400	1015	17	10	DG		BR	S-R	DIST	PLAN-R			51-75	I B	
Bone Lake (7-35- 16W)	Polk	2628100	1781	43	23	DG		BR	S-C CHR	DIST	PLAN			49-64	I B	
Little Blake L	Polk	2627300	76	10		DG		NW BR	S-R	DIST	PLAN-R				I NS	
Loon Lake	Barron	2478600	94	26	11	SE		BR	S-R	ASSC	PLAN-R	XX		45-53	I NS	
North Lake	Barron	2630800	89	21	11	SE		BR	S-R			XX		54-56	I B	
Scott Lake (16-35- 14W)	Barron	2630700	81	26	9	SE		BR	S-R			XX		50-57	I B	
Staples Lake	Barron	2631200	305	17	10	DG		BR	S-R	DIST	PLAN-R			63-79	I B	1 DO
Twin Lake North	Polk	2623900	135	27	11	DG		BR	S-R	DIST	PLAN			50-62	I B	
Twin Lake, South	Polk	2623800	74	9	5	DG	YES		S-R	DIST	PLAN					
White Ash Lake	Polk	2628600	153	9	6	DG		BR	S-C	DIST	PLAN		PL	58-70	I B	
White Ash Lake, North	Polk	2628800	119	9	5	DG	YES	BR	S-R	DIST	PLAN		PL	47-52	I D	1 MAC
Bass Lake, (21- 34-15W)	Polk	2450700	19												I NS	
Brusher Lake	Polk	2455300	67	17		SE									I NS	
Camp Lake (24- 34-16W)	Polk	2456300	17												I NS	
Chelstrom Lake (19-34-15W)	Polk	2457100	50												I NS	
Crystal Lake	Barron	2459500	120	22	10	SE		R	S-R						I NS	
Deedon Lake (30- 34015W)	Polk	2460100	35												I NS	
Gorres Lake (14- 33-16W)	Polk	2466700	10												I NS	
Grass Lake (15- 34-15W)	Polk	2466800	21												I NS	
Mud Lake (16-34- 15W)	Polk	2483900	24												I NS	
Mud Lake (1-34- 15W)	Polk	2630000	55												I NS	
Murdock Lake (35-36-17W)	Polk	2484900	30												I NS	
Omer Lake (22- 33-16W)	Polk	2487200	22												I NS	

Lake Name	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)	Lake Type	Winter-Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
Park Lake (20-33-16W)	Polk	2487800	30											I INS	
Shiloh Lake	Polk	2496500	19											I INS	
Smith Lake (21-34-15W)	Polk	2497800	12											I INS	
Snake Lake (3-34-15W)	Polk	2629500	14											I INS	
Sugarbush Lake (4-34-15W)	Polk	2499800	20											I INS	
Summerfield Lake (29-33-16W)	Polk	2499900	25											I INS	
Townline Lake (24-34-16W)	Polk	2501900	160											I INS	
Twin Lakes (E) (25-34-16W)	Polk	2503401	68											I INS	
Twin Lakes (W) (26-34-16W)	Polk	2503402	40											I INS	
Unnamed Lake (1-34-15W)	Polk	2508555	40											I INS	
Vincent Lake	Polk	2598500	70	15	SE	YES	BR	S-R	ASSC					II INS	
Beautiful Lake	Polk	2452500	30	17	SE									I INS	
Big Lake (Pogo) (33-36-16W)	Polk	2490800	14	17	SE									I INS	
Clara Lake	Polk	2457300	56	71	SE			S-R						I INS	
Johnson Lake (28-36-16W)	Polk	2471400	32	19										I INS	
Lake of the Woods (Bass)	Polk	2632100	46	55	SE			S-R					53-59	I B	
Little Horseshoe Lake (22-34-15)	Polk	24776600	54	28	SE			S-R						I INS	
Little Round Lake	Polk	2629300	67	8	DG		NW							II INS	
Long Lake (20-35-14W)	Barron	2630600	40	13	SE		T						50-57	II B	
Long Lake (20-36-16W) (Mocassin)	Polk	2483100	55	31	SE			S-R						I INS	
Long Lake (26-35-15W)(Helbig)	Polk	2631600	65	44	SE		T	S-C	ASSC					I INS	
Lost Lake (15-35-16W)	Polk	2627200	60	15	DG									II INS	
Martel Lake	Polk	2481200	39	20	SE									I INS	
Round Lake (23-35-15W)	Polk	2631700	23	20	SE									I INS	
Shiloh Flowage	Polk	2626500	19	12										II INS	
Silver Lake	Polk	2496700	28	26	SE		W						47-57	I A	
Straight Lake	Polk	2627800	107	12	DG		NW							II INS	
Gibson Lake	Polk	2465800	43	12	SE	YES	T								
Mud L (Dace) (11-36-15W)	Polk	2631800	11	15											
Mud Lake (16-35-14W)	Barron	2630500	23	11	SE		R								

The State of the St Croix Basin

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Lake Name	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)	Lake Type	Winter-Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
Location (T-R-S)				11 5	SE										
Square Lake	Polk	2498900	35	15											
Unnamed (32-35-14W)	Barron	2511000	30												
Wickerts Lake	Barron	2630900	14	12	SE		R								
Glover Lake	Polk	2457800	17	6	SE		T								
Dahl Lake	Polk	2459900	32	10	SE										
East Lake (33-35-17W)	Polk	2462700	15	8	SE										
Gates Lake	Barron	1850100	15	9											
Glovers Lake (33-35-15W)	Polk	2466200	18	7	SE										
Highland Lake	Polk	2469200	11	3	SE										
Lincoln Lake	Polk	2622400	11	3	SE										
Miller Camp Lake	Polk	2482300	12	10	SE										
Mud Lake (18-34-16W)	Polk	2484000	10	4	SE										
Unnamed Lake (18-36-16W)	Polk	2518700	41	5	SE										
Unnamed Lake (27-35-14W)	Barron	2510500	26	8	SE										

Beaver Brook Watershed Lakes (SC07)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Barbo Lake	Polk	2624900	44	4	2	SE		T								
Echo Lake	Barron	2630200	161	41	20	SE		BR			PLAN-R	XX			I INS	
Magnor Lake	Polk	2624600	231	26	10	SE		BR	S-R		PLAN-R				I D	
Jim Lake (14-33-16W)	Polk	2471200	30						S-C, CH-R	ASSC					I INS	
Paulson Lake (33-33-15W)	Polk	2625000	26	12		SE									II INS	
Gilbert Lake	Polk	2465900	14	14		SE									I INS	
Skinaway Lake	Barron	2497300	37	10		SE	YES	R								
Elbow Lake	Barron	2463000	12	5		SE										
Joel Flowage	Polk	2625700	65	8		DG	YES	T								
Palmer Lake	Polk	2487600	15	2		SE										

Trout Brook Watershed Lakes (SC08)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Lake of the Dalles	Polk	2634200	23	12		SE		TP							II INS	
Poplar Lake	Polk	2491000	125	34	12	SE		BR	S-R	ASSC	PLAN-R				I INS	
Osceola Lake	Polk	2633300	38	14		DG								63-78	II B	
Peaslee Lake	Polk	2633700	23	2		DG										
Rice Lake (11-33-19W)	Polk	2633900	57	3		DG		NW								
Pine Lake (T31N R19W S10)		2489800	33	9			YES	R		R	Plan-R Prot-R			49-58	II INS	
Squaw Lake	St Croix	2499000	129	32	13	SE		BR	S-X	Dist	Prot-R Plan-R			60-79	I B	NUT, ALG, DO, HAB

Wolf Creek Watershed Lakes (SC09)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	Lake Mgt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Indianhead Flowage	Polk	2634400	776	57	11	DG		BR	S-R			XX			II INS	
Herby Lake	Polk	2468900	69	36	16	SE			S-R		PLAN-R			58-76	I B	
Little Mirror Lake	Polk	2477100	33	13	10	SE									II INS	
Tarbert Lake	Polk	2501000	42	20	9	SE		BR	S-R					65-81	I B	
Twin Lakes (14- 35-19W)	Polk	2467800	15	74											I INS	
Twin Lake #1 (18- 35-18W) (Clarey)	Polk	2457400	34	49	18	SE		BF	S-C		PLAN-R			46-66	I A	
Alabama Lake	Polk	2449200	98	28	7	SE	YES	T						58-71	I B	
Bass Lake (Sterling L)	Polk	2452000	78	26	8	SE		T	S-R						I INS	
Big Lake (Center) (19-35-18W)	Polk	2456800	65	12		SE									II INS	
Roger Lake	Polk	2635400	17	12		DG		NW							II INS	
Round Lake (31- 36-18W)	Polk	2494000	39	38		SE									I INS	
T Lake	Polk	2500700	11	45		SE									I INS	
Twin Lake #2 (18- 35-18W)	Polk	2503200	10	22											I INS	
Wolf Lake	Polk	2635900	72	22	11	DG			S-R					63-66	I B	
Grandquist Lake (12-36-19W)	Polk	2635800	10	10		SE										
Mud Lake (18-36- 18W)	Polk	2600900	31	9												
Orr Lake	Polk	2635600	25	12		DG										
Sandhill Lake	Polk	2495400	44	12		SE		BR								
Clauson Lake	Polk	2457500	11	6		SE										
Evergreen Lake	Polk	2463900	16	8		SE										
Horseshoe Lake (Jensen Lake)	Polk	2470100	35	8		SE		BR								
Manitou Lake	Polk	2480900	17	10		SE										
McKeith Lake	Polk	2481500	72	8		SE		R								
Nimon Lake	Polk	2486200	17	6		SE	YES	W								
Pine Island Lake	Polk	2489600	16	7		SE										

Trade River Watershed Lakes (SC10)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Big Butternut Lake	Polk	2641000	378	19	13	DG		BRP	CH-C	DIST	PLAN PROT-R		PL	40-80	II B	
Coon Lake	Polk	2642000	54	16	10	SE	YES	BR	S-R						II INS	
Little Butternut Lake	Polk	2640700	189	23	8	DG	YES	BR	S-R	ASSC					II INS	
Long Trade Lake	Polk	2640500	153	13	8	DG		BR	S-R, CHR	ASSC	PLAN-R		EM-W	52-67	II B	
Round Lake (27- 37-18W)	Burnett	2640100	204	27	15	DG		BR	S-C, CHR	ASSC	PLAN-R	XX		60-73	II B	
Trade Lake, Big	Burnett	2638700	304	39	15	DG		BR	S-C, CHR	ASSC	PLAN-R			56-64	I B	
Trade Lake, Little	Burnett	2639300	130	19				NW	S-C, CHR	ASSC	PLAN-R			56-64	II B	
Bass Lake (17-37- 18W)	Burnett	2638600	43	45		SE			S-R					58-62	I B	
Forsythe Lake	Polk	2641400	30	12		DG									II INS	
Gabelson Lake	Burnett	2639200	38	35		SE			S-R					51	I A	
Holmes Lake	Burnett	2638400	54	26	13	SE	YES	BR	S-R						I B	
Isaac Lake (6-37- 18W)	Burnett	2638100	17	22		SE	YES								I INS	
Little Holmes L (36-37-19)	Burnett	2638200	23	8		DG									II INS	
Lone Pine Lake	Polk	2478000	17	20		SE									I INS	
Pickle Lake	Burnett	2639100	20	20		SE									II INS	
Pine Lake (22-37- 18W)	Burnett	2490100	51	46	20	SE			S-R					41-50	I A	
Rice Lake (25-37- 18W)	Burnett	2640300	50	5		SE									II D	
Spook Lake	Burnett	2639800	18	40		SE			S-R						I INS	
Hatchet Lake	Polk	2468100	17	15		SE										
Fish Lake (1-37- 20W)	Burnett	2636500	175		YES	DG									II D	State waterfowl improvement
Freedom Lake, No. 1	Polk	2641501	51	4												
Freedom Lake, No. 2	Polk	2641502	106	4												
Land Lake	Polk	2474000	10	5		SE										
Young Lake	Polk	2601200	30	10		SE										

Wood River Watershed Lakes (SC11)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Mud Hen Lake	Burnett	2649500	563	66	14	SE		BF	CH-C	DIST	PLAN-R	XX		38-53	I A	
Little Wood Lake	Burnett	2650900	207	23		DG		BR	CH-C		PLAN-R			53-55	II B	
Spirit Lake	Burnett	2650300	593	27	12	DG		BR	S-C, CH-R	ASSC	PLAN-R			53-54	II B	
Wood Lake (Big Wood)	Burnett	2649800	521	35	16	DG		BF	S-C, CH-R	ASSC	PLAN PROT-R			54-62	I B	
Big Doctor Lake	Burnett	2453400	212	9	6	SE		BF	S-R		PLAN-R				II INS	
Clear Lake	Burnett	2457600	115	55	24	SE		BR	S-C, CH-R		PLAN-R			36	I A	
Dunham Lake	Burnett	2651800	243	63	35	DG		BR	S-R		PLAN-R	XX		42	I A	
Memory Lake	Burnett	2646500	10	6		DG		W			PLAN-R			61	II D	WLF TURB
Rice Lake (17-37-17W)	Polk	2650600	20												I INS	
Fountain Lake	Polk	2465000	24	20		DG									I INS	
Grimms Lake	Polk	2467400	31	43		SE								37-52	I A	
Indian Lake	Burnett	2651700	17	15		SE	YES								I INS	
Lind Lake	Burnett	2475400	42	19		SE									I INS	
Little Dunham Lake	Burnett	2476300	11	33		SE								35	I A	
Peterson Lake (3-37-18W)	Burnett	2650100	24	11		SE									II INS	
Rice Lake (10-37-18W)	Burnett	2650200	83	13		SE								47-53	II A	
Silver Lake (36-38-18W)	Burnett	2651500	33	35		SE									I INS	
Ward Lake (24-38-17W)	Burnett	2599500	18	21		SE									I INS	
Blom Lake	Polk	2651300	208	13	5	DG		R								
Diamond Lake	Polk	2461200	126	15		SE	YES	BR	S-R					46-51	II A	
Doctor Lake	Burnett	2461500	64	7	5	SE	YES	R								
Elbow Lake, East	Burnett	2463101	110	8			YES	BR								
Elbow Lake, West	Burnett	2463102	123	6			YES			ASSC						
Fish Lake (6-38-16W)	Burnett	2464400	94	6	4	SE	YES	BR								
Aspen Lake (Hickory L)	Polk	2652400	11	13		SE										
Black Lake	Burnett	2453900	11	6		SE	YES									
Blomberg Lake	Burnett	2649700	68	4		SE	YES	W								
Fern Lake	Polk	2464200	17	7		SE										
Grass Lake (5-37-17W)	Polk	2651200	56	3		DG										
Hickory Lake (Aspen Lake)	Polk	2652300	18	14		SE										
Hunters Lake	Burnett	2651100	63	5		SE	YES									
Swamp Lake (30-38-16W)	Burnett	2500300	39	3		SE	YES									

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Unnamed Lake (12-37-18W)	Burnett	2531500	26	7			YES									
Unnamed Lake (25-38-17W)	Burnett	2541200	33	5			YES	R								
Wilson Lake	Burnett	2600700	10	13		SE	YES									

Clam River Watershed Lakes (SC12)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
McKenzie Lake	Polk	2667300	60	25	9	DG		T	S-R					45-54	IA	
Bass Lake (31-36-15W)	Polk	2450800	138	19	6	SE		T	S-R					38-53	IIA	
Clam Falls Flowage	Polk	2666400	127	14	6	DG		BR	S-R		PLAN-R			53-56	IIB	
Clam Lake, Lower	Burnett	2655300	337	14	7	DG		BR	S-R	DIST ASSC	PLAN-R		PC	59-70	IIB	1 MAC
Clam Lake, Upper	Burnett	2656200	1207	11	5	DG		BR	S-R	DIST ASSC	PLAN-R		PC	54-64	IIB	1 MAC
Greenquist Lake	Polk	2669300	58	30	13	SE		BR	S-C		PLAN-R			63-71	I INS	
Largon Lake	Polk	2668100	129	10	6	DG	YES	BR	S-C	DIST	PLAN			59-69	IIB	
Pickrel Lake (Crescent)	Polk	2458900	19	45	15	SE	YES	BR	S-R						I INS	
Ward Lake	Polk	2599400	91	43	16	SE		BR	CH-C	ASSC	PLAN	XX		49	IA	
Clam River Flowage	Burnett	2654500	359	29	11	DG		BR	S-R		PLAN-R			51-64	IIB	
Crooked Lake	Burnett	2459100	180	10	6	SE		BRP	S-C	ASSC	PLAN-R			49	IIA	
Godfrey Lake	Burnett	2466300	56	41	8	SE		BR	S-R					44	IA	
Long Lake (16-38-16W)	Burnett	2656400	318	13	5	DG		NW						61	IID	
Sand Lake (22-38-16W)	Burnett	2664900	81	42	17	SE		R	S-R					44	IA	
Somers Lake	Polk	2665900	101	12	5	DG		BR							II INSS	
Viola Lake	Burnett	2598600	285	34	13	SE		BF	S-R		PLAN-R			38	IA	
Andrus Lake	Polk	2668600	25	12		DG									II INS	
Cranberry Lake (5-38-15W)	Burnett	2458600	79	23		SE			S-R					51	IA	
Godfrey Lake	Polk	2665700	23	15		DG									I INS	
Knapp Flowage	Polk	2665600	35	12		DG								48-60	I B	
Lamont Lake	Polk	2668500	96	28	10	SE			S-R						I INS	
Larson Lake	Burnett	2474300	31	12		SE	YES							57-76	IIB	
Little Largon Lake	Polk	2668200	19	29		SE	YES			DIST					I INS	
Margaret Lake	Polk	2666900	43	17		SE		T							I INS	
Owl Lake	Burnett	2656000	127	27	7	SE		W						51	IA	
Pike Lake	Burnett	2489500	77	15	7	SE								49	IIA	
Pine Lake (24-36-16W)	Polk	2489900	153	53	19	SE			S-R					50-62	IA	
Silver Lake (22-38-16W)	Burnett	2496800	64	67	24	SE			S-R						I INS	
Dinger Lake	Polk	2461300	16	16	7	SE		T								
Mud Lake (14-36-15W)	Polk	2669200	15	7		SE										
Taylor Lake	Burnett	2655900	80	10	6	SE	YES	BR								

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Baker Lake	Polk	2449700	22	9		SE										
Briar Lake (1-37-16W)	Polk	2454900	13	6		SE										
Crooked Lake	Polk	2459000	12	6		SE										
Deer Lake (23-36-15W)	Polk	2460500	16	5		SE										
Ember Lake	Polk	2463600	13	6		DG										
Footes Lake	Polk	2464900	55	8		SE										
Grouse Lake	Polk	2467500	23	10		SE										
Hawthorne Lake	Polk	2468400	12	6		SE										
Ice Lake	Polk	2470200	20	11		SE										
Johnson Lake (26-36-15W)	Polk	2669000	38	23		SE										
Little Deer Lake	Burnett	2476200	14	4		SE	YES	W								
Little Ward Lake	Polk	2477900	18	7		SE										
Little Pine Lake (13-36-16W)	Polk	2477200	21	7	6	SE										
Mackie Lake	Polk	2667700	34	5		SE										
Mallard Slough	Burnett	2655800	25	4		SE	YES									
Miller Lake (17-38-16W)	Burnett	2471800	22	3		SE	YES	T								
Put Lake	Burnett	2491600	19	3		SE	YES									
Rohr Lake	Burnett	2493000	12	5		SE	YES									
Sedge Lake	Polk	2668400	20	3		DG										
Snowshoe Lake	Polk	2498100	13	8		SE										
Tamarack Lake	Burnett	2656100	13	3		SE	YES	W								
Tula Lake	Polk	2667200	15	5		SE										
Unnamed Lake (7-38-15W)	Burnett	2539100	46	5		SE	YES									
Wintergreen Lake	Polk	2669100	18	12		SE										

North Fork Clam River Watershed Lakes (SC13)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Pokagama Lake	Burnett	2657200	224	56	4	SE		BR	S-R					41-53	I A	
Poquettes Lake (Little Long)	Burnett	2491100	97	23	10	SE		BR	S-R					44-53	I A	
Sand Lake	Barron	2661100	322	57	28	DG		BR	CH-C	ASSC	PLAN-R			39-59	I A	
Horseshoe Lake (3-36-14W)	Barron	2469800	115	19	10	SE		BR	S-R						II INS	
Little Sand Lake	Barron	2661600	101	36	13	SE		BR	S-R						I INS	
Bashaw Lake	Burnett	2662400	171	16	7	DG		BR	S-R					61	II B	
Leach Lake	Washburn	2474400	30	32	13	SE		T	S-R					46-52	I A	
Waterman Lake, Lower	Barron	2660900	14	21		DG		R							II INS	
Warner Lake	Burnett	2677200	176	75	19	SE		R	S-R					39	I A	
Bass Lake (25-38- 15W)	Burnett	2451000	39	34		SE								32	I A	
Bass Lake (9-38- 15W)	Burnett	2450900	110	18	5	SE	YES							44	II A	
Buck Lake	Burnett	2663800	18	31		SE	YES								I INS	
Kent Lake	Burnett	2656900	31	16		SP		NW							I INS	
Kinney Lake	Washburn	2472500	10	27		SE	YES	R						54	IB	
Little Bass Lake	Barron	2475500	24	56		SE									I INS	
Little Bass Lake (24-38-15)	Burnett	2475600	10	12		SE									I INS	
Little Bass Lake (36-38-15)	Burnett	2659300	11	30		SE									I INS	
Spencer Lake	Burnett	2658400	188	19	10	SE	YES	W	S-R					57	II D	
Thirty-Two Lake	Burnett	2473700	22	17		SE	YES								I INS	
Twin Lake, North	Burnett	2485800	27	26											I INS	
Twin Lake, South	Burnett	2494300	19	25		SE									I INS	
Waterman Lake, Upper	Barron	2660800	22	47	20	DG									II INS	
Little Long Lake	Washburn	2664500	112	11	6	SE	YES	T	S-R							
Peacock Lake	Burnett	2659700	14	13		SE	YES	W								
Bullhead Lake	Barron	2455700	14	8		SE										
Denny Lake	Polk	2658200	12	8		SE										
Glendenning Lake	Burnett	2662900	20	3		SE	YES									
Kelleys Lake	Barron	2471900	19	12		SE		W								
Places Lake	Burnett	2490600	13	13		SE	YES									
Severson Lake	Washburn	2496000	29	5		SE	YES									
Unnamed Lake (29-36-14W)	Barron	2517400	28	5		SE										

Lower Yellow River Watershed Lakes (SC14)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Big Sand Lake	Burnett	2676800	1400	55	9	SE		BR	S-C	ASSC	PLAN-R			39-50	I A	
Des Moines Lake	Burnett	2674200	229	37	23	SE		BR	S-R, CH-R		PLAN-R			35	I A	
Fish Lake (4-40-14W)	Burnett	2464500	356	29	10	SE		BR	CH-C	ASSC	PLAN-R			38-50	I A	
Little Bear Lake	Burnett	2476000	128	55	27	SE		BR	S-R					36-43	I A	
Long Lake (28-41-14W)	Burnett	2674100	251	41	18	SE		BR	S-C, CH-R	ASSC	PLAN-R			33-52	I A	
Sand Lake (NO) (25-40-15W)	Burnett	2495100	962	73	24	SE		BR	CH-R	ASSC	PLAN-R	XX		33-47	I A	
Twenty-Six Lake	Burnett	2672500	230	45	20	DG		BR	S-R	ASSC	PLAN-R			42-53	I A	
Banach Lake	Burnett	2450100	16	40	12	SE	Y	BF						39	I A	
Devils Lake	Burnett	2461100	1,001	24	14	SE		BF	S-C, CH-R	ASSC	PLAN-R			45-60	I A	
Falk Lake	Burnett	2670900	82	32	11	DG		BR	CH-C	ASSC	PLAN-R				I A	
Gull Lake	Burnett	2671100	182	19	4	DG		T + NW	CH-C	ASSC	PLAN-R			45	I A	
Little Yellow Lake	Burnett	26474800	348	21	10	DG		NW	S-C, CH-R	ASSC	PLAN-R				I I NS	
Love Lake	Burnett	2671000	253	65	22	DG		NW	CH-C	ASSC	PLAN-R			40-50	I A	
Minerva Lake	Burnett	2670600	222	26	14	DG		BR	CH-C	ASSC	PLAN-R			44-58	I A	
Yellow Lake	Burnett	2675200	2287	31	19	DG		BF	S-C, CH-R	ASSC	PLAN-R	XX		59-72	I I B	
Big Lake (Peterson Lake)	Burnett	2676000	94	16	7	SE	Y	BR							I I NS	
Birch Island Lake	Burnett	2453500	838	13	6	SE	Y	BR	CH-C	ASSC	PLAN-R				I I NS	
Bonser Lake	Burnett	2454500	89	15	9	SE		BR						57	I I B	
Briggs Lake	Burnett	2671900	55	13	4	DG		BR						44	I A	
Burlingame Lake	Burnett	2671400	57	19	10	DG		BR	S-R	ASSC				41-60	I A	
Cadotte Lake	Burnett	2673600	127	21	10	SE		NW	S-R					38	I A	
Connors Lake	Burnett	2458300	113	16	7	SE		BR	S-R					45-61	I A	
Cranberry Lake (36-41-16W)	Burnett	2670700	23	26	6	DG		NW	CH-C	ASSC	PLAN-R PROT-R				I NS	
Crooked Lake (7-40-15W)	Burnett	2459200	254	13	6	SE		BR	S-R						I I B	
Culbertson Lake	Burnett	2673200	28	34		DG		T							I A	
Danbury Flowage	Burnett	2674500	256	10		DG		BR	S-R						I I NS	
Eagle Lake (34-41-15W)	Burnett	2672100	71	14	9	DG		NW						45-58	I A	
Green Lake	Burnett	2467200	274	6	4	SE		BF						52-77	I I D	
Ham Lake	Burnett	2467700	324	29	9	SE		R	S-R					42	I A	
Johnson Lake	Burnett	2471600	397	23	6	SE		BR	CH-C	ASSC	PLAN-R	XX		37-54	I A	
Lang Lake, North	Burnett	2673000	16	10		DG		BR							I I NS	
Little Round Lake	Burnett	2477600	13	40		SE		R						44	I A	
Loon Lake	Burnett	2673500	228	28	10	SE		BR	S-R					45-54	I A	
Loon Lake (30-41-15W)	Burnett	2671200	89	10		DG		BR							I I NS	
Round Lake (33-41-16W)	Burnett	2493700	56	11		SE		BR						45	I A	
Tabor Lake	Burnett	2671700	157	28	13	SE		BR	S-R					57	I B	
Austin Lake	Burnett	2675700	86	48	23	DG			S-R					39-52	I A	
Bartash Lake	Burnett	2450400	22	21		SE	Y							42	I A	

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Bass Lake (13-40-17W)	Burnett	2675000	236	6	4	SE	Y	BR		ASSC	PLAN-R			55	II B	
Bass Lake (13-41-16W)	Burnett	2451600	67	12	8	SE	Y		S-R					43-51	II A	
Bass Lake (23-39-16W)	Burnett	2451200	226	24	11	SE			S-C, CH-R		PLAN-R			47	II A	
Berg Lake	Burnett	2453100	42	45		SE								38	I A	
Bluff Lake	Burnett	2454200	51	23		SE								39	I A	
Bogey Lake	Burnett	2454300	24	20		SE								36	I A	
Bricher Lake (10-40-16W)	Burnett	2455000	27	25		SE									I INS	
Fremstadt Lake	Burnett	2465200	88	22	7	SE	Y		S-R					39	I A	
Hansom Lake	Burnett	2674000	127	7	5	SE	Y	T						50	II A	
Hayden Lake	Burnett	2468700	59	12		SE								44-61	II B	
Horseshoe Lake	Burnett	2469900	17	29		SE									I INS	
Island Lake	Burnett	2470700	23	56		SE								39	I A	
Lily Lake (6-39-15W)	Burnett	2675900	15	44		SE		BR						42	I A	
Little Bass Lake (22-40-16)	Burnett	2475800	34	12		SE	Y								II INS	
Lone Star Lake	Burnett	2675400	23	40		SE									I INS	
Long Lake (33-41-16W)	Burnett	2478300	49	14		SE	Y	W						42	II A	
Mallard Lake	Burnett	2480800	113	35	14	SE		BR	S-R	ASSC				37-52	I A	
Minnow Lake	Burnett	2482900	57	50	28	SE			S-R	ASSC					I INS	
Myre Lake	Burnett	2485200	128	27	8	SE	Y		S-R						I INS	
North Lake	Burnett	2676100	33	22	6	SE		T						45-55	I A	
Oak Lake	Burnett	2486600	227	19	8	SE		R	S-R					44	II A	
Pine Lake (25-40-15W)	Burnett	2490200	89	19	5	SE			S-R					44	II A	
Point Lake	Burnett	2490900	144	7		SE	Y		S-R, CH-R	ASSC				52-54	II A	
Robie Lake	Burnett	2671500	31	14		DG		NW						42	II A	
Shoal Lake	Burnett	2673800	247	5	3	SE	Y	NW							II INS	
Staples Lake	Burnett	2499200	85	42	17	SE		W	S-R					38-46	I A	
Twin Lake, Upper	Burnett	2598400	163	18	5	SE		W						51	II A	
Bass Lake (23-40-15W)	Burnett	2451400	42	8		SE										
Buck Lake	Burnett	2455500	67	6	4	SE	Y									
Buffalo Lake	Burnett	2674700	69	4		SE	Y									
Echo Lake	Burnett	2462900	24	9		SE		NW								
Gaslyn Lake	Burnett	2677700	164	12	6	DG	Y	BR						59-67	II B	
Lang Lake	Burnett	2474100	85	4		SE	Y									
Mud Lake (26-40-16W)	Burnett	2484400	163	3		SE	Y									
Mud Lake (34-41-15W)	Burnett	2672300	26	7		SE	Y	NW								
Stone Lake	Burnett	2499500	34	11		SE	Y	W								
Ann Lake (31-40-15W)	Burnett	2676400	27	6	6	SE		NW								

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Baker Lake (18-39-14W)	Burnett	2449900	27	6		SE	Y	T								
Baker Lake (2-39-15W)	Burnett	2450000	20	4		SE	Y	W								
Crystal Lake	Burnett	2459600	32	5		SE		NW								
Keizer Lake (30-40-15W)	Burnett	2676200	24	4	3		Y	BR								
Kreiner Lake	Burnett	2675100	65	2		SE		W								
Little Mallard Lake	Burnett	2476900	24	6		SE	Y	W								
Lost Lake (27-39-15W)	Burnett	2479400	34	2		SE										
Mingo Lake	Burnett	2482700	16	9		SE										
Mollete Lake	Burnett	2483200	25	4		SE		W								
Money Lake	Burnett	2483300	46	3		SE	Y									
Pherneton Lake	Burnett	2488800	61	5		SE	Y									
Pratt Lake	Burnett	2491200	21	4		SE	Y	W								
Round Lake (3-39-15W)	Burnett	2493600	27	5		SE		W								
Sanks Lake (30-41-14W)	Burnett	2495500	39	4		SE	Y									
Swamp Lake (11-39-15W)	Burnett	2500400	21	5		SE		W								
Tanda Lake	Burnett	2500800	39	4		SE	Y									
Temple Lake	Burnett	2501100	18	6		SE	Y	W								
Tomoe Lake	Burnett	2676300	67	6	4	SE	Y	W								
Tucker Lake	Burnett	2502600	47	2		SE	Y									
Twin Lake, Lower	Burnett	2480000	123	9		SE	Y									

Shell Lake & Upper Yellow River Watershed Lakes (SC15)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Big Ripley Lake (4-37-12W)	Washburn	2492600	190	27	10	SE		BR	S-R					39-50	I A	
Deep Lake (18- 38-11W)	Washburn	1844000	43	25	13	SE		BR	S-C, CHR	ASSC	PLAN-R			43-47	I A	
Shell Lake	Washburn	2496300	2580	36	23	SE		BF	S-C, CHR	DIST	PLAN PROT-R	XX		30-52	(1) A	WLF
Lipsett Lake	Burnett	2678100	393	24	13	DG		BR	CH-C	ASSC	PLAN-R			49	II A	
Pavlas Lake	Washburn	2488100	44	45	14	SE		BR	S-R					49	I A	
Spooner Lake	Washburn	2685200	1092	17	7	DG		BF	S-R	DIST	PLAN PROT-R			46-56	II D	
Yellow River Flowage	Washburn	2681600	344	17	2	DG		BFP						47-58	II D	
Benoit Lake	Burnett	2678300	297	41	17	SE		BR	S-R, CHR					47	I A	
Cable Lake	Washburn	2456100	185	24	7	SE	Y	BR	S-R					47	I A	
Elisworth Lake	Washburn	2463500	174	6	4	SE	Y	BR							II INS	
Lost Lake (4-37- 12W)	Washburn	2479300	12	21		SE		BR						47	I A	
Miller Lake	Washburn	2482400	35	29	7	SE		BR						54	I D	
Rice Lake (10-39- 14W)	Burnett	2677900	326	10	4	DG		BR	S-R						II INS	
Tozer Lake	Washburn	2502000	36	46	18	SE		BR	S-R					42	I A	
Alder Lake	Washburn	1831900	11	32		SE									INS	
Bass Lake (24-39- 14W)	Burnett	2451100	31	27		SE		W						41-50	I A	
Browns Lake	Washburn	2685000	26	44		DG			S-R					55-63	I B	
Cranberry Lake	Washburn	2680500	19	6		DG		NW							II D	
Cyclone Lake	Washburn	2459800	91	18	9	SE			S-R					42	II A	
Harrison Lake	Washburn	2683200	17	27	7	SE	Y	W						47	I A	
Little Spooner Lake	Washburn	2685400	31	11		SE	Y	R						45	II A	
Little Ripley Lake (9-37-12W)	Washburn	2477300	47	14		SE	Y	R-T	S-R		PLAN			46-57	II B	
Lutz Lake	Washburn	2684900	19	13		DG		T							II INS	
Oak Lake (7-38- 11W)	Washburn	1871300	33	50		SE		BR	S-C					40-42	I A	
Perch Lake	Washburn	2488400	19	15		SE								54	I D	
Pine Lake	Washburn	2490000	24	12		SE		T						44	II A	
Ripley Lake (19- 38-11W)	Washburn	1877000	42	25		SE		T	S-R					40-49	I A	
Round Lake (5- 37-12W)	Washburn	2493400	28	27		SE		BR	S-R		PLAN			49	I A	
Schullenberger L	Washburn	2495700	12	25		SE		T						51	I A	
Yechout Lake	Washburn	2601000	56	25	8	SE	Y							51	I A	
Chain Lake	Washburn	2456900	25	7		SE	Y	NW								
Evergreen Lake	Washburn	2463800	16	8		SE	Y	T								
Goose Lake (14- 39-13W)	Washburn	2466400	70	11	5	SE	Y	BR								
Randall Lake	Washburn	2682600	38	6	4	SE	Y	NW								
Sport Lake	Washburn	2498400	23	11		SE	Y									

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	Lakem gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Unnamed Lake (22-38-12W)	Washburn	2684800	73	12		DG	Y									WLF
Casper Lake	Washburn	1839600	18	19		SE										
Dock Lake	Washburn	2461400	47	6	4	SE	Y									
Glendennon Lake	Washburn	2466100	11	7		SE	Y									
Holmes Lake	Washburn	2469500	20	6		SE	Y	T								
Johnson Lake	Washburn	2471500	22	9		SE	Y	T								
Leonard Lake	Washburn	2475100	10	5		SE	Y									
Little Cable Lake	Washburn	2476100	45	7		SE	Y									
Little Grassy Lake	Washburn	2476400	23	5		SE	Y	T								
Round Lake (18- 37-12W)	Washburn	2493500	39	15		SE		W								
Shingle Camp L	Washburn	2496600	19	11		SE		W								
Starkey Lake	Washburn	2499300	22	6		SE	Y									
Stone Lake (31- 38-11W)	Washburn	1884000	39	9		SE	Y	W								
Tony Lake	Washburn	2681400	15	1		SP										
Unnamed Lake (32-39-13W)	Washburn	2546500	29	8		SE		R								
Unnamed Lake (6- 37-11W)	Washburn	1965000	48	11												
Welsh Lake	Washburn	2600000	69	8	3	SE	Y	T								
Wilkerson Lake	Washburn	2600600	86	8	4	SE	Y									

Upper Tamarack River Watershed Lakes (SC16)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	Lake Mgt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Radigan Flowage	Douglas	2687500	62	10	2	DG	Y	BR							II D	

St. Croix and Moose Rivers Watershed Lakes (SC17)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	Lake Mgt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Little McGraw Lake	Burnett	2477000	55	12	6	SE	Y	BR							II INS	
McGraw Lake	Burnett	2688800	135	25	13	SE		BR	S-R					50-59	I B	
Round Lake (12-43-13W)	Douglas	2493900	36	76					S-R					36-50	I A	
Scott Lake	Douglas	2495800	22	14		SE	Y							41	I A	
Deer Lake	Douglas	2737800	19	19		SE	Y									
Moose Lake	Douglas	2740100	13	9		SE	Y	T								
Wilson Lake	Douglas	2600800	27	9		SE	Y									
Moose Branch Flowage	Douglas	2739400	40	5		DG	Y	T								

Upper St. Croix & Eau Claire River Watershed Lakes (SC18)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Beauregard Lake	Douglas	2452400	93	20	11	SE		BR	S-R, CHR	ASSC	PLAN-R			42-49	I A	
Birch Lake (5-44-9W)	Bayfield	2743200	129	8	5	DG		NW		ASSC					II INS	
BonyLake	Bayfield	2742500	191	55	23	DG		NW	S-C, CHR	ASSC	PLAN-R			33	I A	
Eau Claire Lake, Low	Douglas	2741600	802	41	22	DG		BR	S-C, CHR	ASSC	PLAN-R			39-51	I A	
Eau Claire Lake, Middle	Bayfield	2742100	902	66	17	DG		BF	S-C, CHR	ASSC	PLAN-R	XX		31-50	I A	
Eau Claire Lake, Upper	Bayfield	2742700	996	92	29	DG		BF	S-C, CHR	ASSC	PLAN-R	XX		28-48	I A	
Long Lake (31-45-11W)	Douglas	2751000	46	18	8	SE		BR						40-53	I A	
Pickrel Lake	Bayfield	2489200	81	38	12	SE		BF	S-C, CHR	ASSC	PLAN-R			27-44	I A	
Robinson Lake	Bayfield	2743300	91	36	14	DN		BF	S-C, CHR	ASSC	PLAN-R			41	I A	
Shunenberg Lake	Bayfield	2743600	44	6		DG		NW	CHR	ASSC	PLAN-R			38-40	II A	
Simms Lake	Douglas	2497100	154	41	27	SE		T	S-R		PLAN-R			36-46	I A	
Smith Lake	Bayfield	2743500	31	8		DG		NW	CHR	ASSC	PLAN-R				II INS	
Swett Lake	Bayfield	2743700	88	38	14	DN		T	S-R, CHR	ASSC	PLAN-R					
St Croix Flowage	Douglas	2740300	1913	28	7	DG		BF	CH-C		PLAN, PROJ	XX		44-56	II D	
Upper St. Croix Lake	Douglas	2747300	844	22	13	DG		BF	CH-C	ASSC	PLAN PROJ-R	XX		54-56	II B	
Bass Lake (32-45-11W)	Douglas	2744500	53	9	6	SE		BR						51-56	II A	
Cranberry Lake (30-44-9W)	Bayfield	2741700	131	12		DG		NW	S-R, CHR	ASSC	PLAN-R			44	II A	
Devils Lake	Bayfield	2742800	23	54		DG		NW	S-R, CHR	ASSC	PLAN-R			57	I B	
Eau Claire River Flowage	Douglas	2740900	56	22	8	DG		R	S-R					38	II A	
Island Lake (18-45-9W)	Bayfield	2470800	59	51	20	SE		BR	S-C, CHR	ASSC	PLAN-R			39	I A	
Lake of the Woods	Douglas	2473300	34	18	6	SE		BR	S-R					44	I A	
Loon Lake (13-45-10W)	Douglas	2470900	109	20	8	SE		R	S-R					41	II A	
Ox Lake, Lower	Douglas	2744300	38	16	3	DG		BR	S-R					45	II A	
Ox Lake, Upper	Douglas	2744700	64	19	8	DG		BR	S-R					49-54	II A	
Park Creek Pond	Douglas	2748000	11	7	3	SP		T							II INS	
Rock Lake	Douglas	2492900	42	15	6	SE	Y	BR						38-62	II A	
Sand Bar Lake	Bayfield	2494900	118	49	25	SE		NW	S-C, CHR	ASSC	PLAN-R			38	I A	
Sand Lake	Douglas	2495300	101	18	9	SE	Y	R	S-R					38	II A	
Pigeon Lake	Bayfield	2489400	213	26	12	SE		BR	S-C, CHR		PLAN-R	XX		31-38		
Sauntrys Pocket	Douglas	2495600	110	9	4	SE	Y	BR	S-R					44-56	II B	
Tomahawk Lake	Bayfield	2501700	134	42	13	SE		BR	S-C, CHR	ASSC	PLAN-R			42	I A	
Bass Lake (6-45-9W)	Bayfield	2451800	20	16		SE	Y		S-R						I INS	
Blue Lake	Bayfield	2454000	21	22		SE	Y		S-R						I INS	
Breakfast Lake	Bayfield	2454800	11	19		SE	Y	T	S-R						I INS	
Eight Mile Lake East	Bayfield	2462200	33	24	10	SE								35	I A	

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Eight Mile Lake, West	Bayfield	2598800	16	18		SE	Y	W							I NS	
Ellison Lake	Bayfield	2463300	110	18	13	SE			S-C, CHR	ASSC	PLAN-R			49	II A	
George Lake	Bayfield	2465700	46	50	16	SE		BR	S-C, CHR	ASSC	PLAN-R			41	I A	
Haugen Lake (Pagan)	Douglas	2468300	27	25		SE		W						47	I A	
Hopkins Lake	Douglas	2469700	15	17		SE								40	I A	
Idlewild Lake	Bayfield	2470300	16	22	12	SE								41	I A	
Island Lake	Douglas	2470900	46	17	8	SE									I NS	
Jack Pine Lake	Douglas	2471000	15	12		SE	Y							45	I A	
Kelly Lake	Bayfield	2472000	56	17	12	SE			S-C, CHR	ASSC	PLAN-R			47	II A	
Little Island Lake	Bayfield	2476800	70	15		SE	Y							38-49	II A	
Lund Lake	Douglas	2480300	75	31		SE			S-R					42-55	I A	
Metzger Lake	Douglas	2482000	12	29		SE								41	I A	
Mimi Lake	Bayfield	2482600	10	21		SE		T							I NS	
Mountain Lake	Bayfield	2483700	11	14		SE	Y	W						44	I A	
Murray Lake	Douglas	2485000	43	15		SE								45	II A	
Priest Lake	Bayfield	2491400	29	52		SE								41	I A	
Spider Lake	Douglas	2498300	63	15		SE	Y	W	S-R	ASSC	PLAN-R			48-49	II A	
Swenson Lake	Douglas	2500600	15	15		SE	Y							41	I A	
Webb Lake	Douglas	2599800	55	25		SE		W	S-R	ASSC	PLAN-R			38-46	I A	
Whiteside Lake	Douglas	2600200	16	19		SE	Y							47	I A	
Wilderness Lake	Bayfield	2600500	63	18	8	SE	Y	W						41	I A	
Alexander Lake	Douglas	2449300	51	8	5	SE	Y	BR	S-C							
Camp Nine Lake	Bayfield	2456500	10	12		SE	Y	BR								
Catherine Lake	Douglas	2456700	72	11		SE	Y									
Ferguson Lake	Douglas	2747700	10	7		DG	Y									
Henderson Lake	Bayfield	2468800	33	5	3	SE	Y	R								
Little Simms Lake	Douglas	2477800	12	11		SE	Y									
Mirror Lake	Douglas	2483000	25	8		SE	Y									
Ole Lake (18-45- 9W)	Bayfield	2487100	13	11		SE	Y	T								
Thorne Lake	Douglas	2501300	29	6	4	SE	Y	W								
Travers Lake	Bayfield	2502200	20	10		SE	Y	T								
Turtle Lake	Bayfield	2502900	22	7		SE	Y	W	S-C, CHR	ASSC	PLAN-R					
Twin Lake	Bayfield	2503300	28	8		SE	Y	T								
Twin Lks, East	Douglas	2462400	113	5			Y									
Twin Lks, West	Douglas	2599000	66	5			Y	R								
Barnes Lake	Bayfield	2743000	16	7		SE	Y									
Bird Sanctuary Lake	Douglas	2453700	10	8		SE	Y									
Black Fox Lake	Douglas	2453800	36	5		SE	Y									
Boot Lake	Douglas	2454600	16	2		SE	Y									
Connor Lake	Bayfield	2458400	14	9		SE	Y									
Deer Print Lake	Douglas	2746100	20	7		SE	Y									
Flat Lake	Douglas	2464700	58	6	3	SE	Y	T								
Hay Lake (18-45- 9W)	Bayfield	2468600	16	5		SE	Y	W								
High Life Lake	Douglas	2469100	20	6		SE	Y									
Lamareau Lake	Bayfield	2473900	10	3		SE	Y	W								

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Muck Lake (12-45-10W)	Douglas	2483800	39	6		SE	Y		S-C	ASSC	PLAN-R					
Mud Lake (12-44-10W)	Douglas	2484700	56	6		SE	Y	T								
Muskkrat Lake	Douglas	2744600	20	9		SE	Y	R								
Paradise Lake	Douglas	2487700	21	6		SE	Y									
Pond Lake (17-44-8W)	Bayfield	2750900	42	7		SE	Y	W								
Unnamed (29-44-9W)	Bayfield	2587900	31	5			Y									
Unnamed (5-43-10W)	Douglas	2577800	25	3		SE	Y	WT								

Lower Namekagon River Watershed Lakes (SC19)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Bass Lake (29-40-13W)	Washburn	2451300	144	31	18	SE		BR	CH-C	ASSC	PLAN-R			30-45	I A	
Big McKenzie Lake	Burnett	2706800	1185	71	19	DG		BR	S-C, CH-R	ASSC	PLAN			37-59	I A	
Island Lake	Washburn	2470600	276	44	14	SE		BR	S-R					41	I A	
Leisure Lake	Washburn	2475000	75	26	12	SE		BR	S-R					37-49	I A	
Rooney Lake	Burnett	2493100	322	30	10	SE		BR	CH-C	ASSC	PLAN-R			41-53	I A	
Webb Lake	Burnett	2705400	762	311	14	DG		R	EX-C	ASSC	PLAN-R			44-54	I A	
Big Casey Lake	Washburn	2709100	247	27	10	DG		BR	S-C					39	I A	
Dunn Lake	Washburn	2709800	193	39	18	DG		BR	S-C					47	I A	
Matthews Lake	Washburn	2710800	263	26	12	SE		BR	S-C					40	I A	
McKenzie Lake, Lower	Washburn	2706300	185	17	9	DG		BR	CH-C	ASSC	PLAN			44	I A	
Middle McKenzie Lake	Burnett	2706500	530	45	20	DG		BR	S-C, CH-R	ASSC	PLAN			45	I A	
Goose Lake	Burnett	2466500	68	6	3	SE	Y	BR							II INS	
Lincoln Lake	Washburn	2710300	101	27	13	DG		BR	S-R					47-55	I A	
Little Bass Lake (31-40-13W)	Washburn	2475700	26	51	17	SE		R							I A	
Little Casey Lake	Washburn	2709900	28	22		DG		NW						46-57	I A	
Mystery Lake	Burnett	2485400	26	51	19	SE		R						40	I A	
Nicaboyne Lake	Burnett	2486100	291	34	12	SE		BR	S-R					47	I A	
Pear Lake	Washburn	2488200	49	32	17	SE		BR	S-R					41	I A	
Prinel Lake (Frog Lake)	Burnett	2491500	64	12	7	SE		BR		ASSC					II INS	
Rocky Ridge Lake	Washburn	2707300	84	16	2	DG		X	S-R					41	I A	
Saginaw Lake	Burnett	2494700	13	19		SE		BR						39	I A	
Silver Lake	Washburn	2496900	188	28	10	SE		BR	S-R			XX		42	I A	
Sunfish Lake	Washburn	2500100	68	33	11	SE		BR	S-R					51	I A	
Bass Lake (3-41-14W)	Burnett	2451500	30	35		SE		W						40	I A	
Behr Lake	Burnett	2452900	38	15		SE	Y								II INS	
Big Bear Lake	Burnett	2705700	189	17	7	SE	Y		S-C					35-49	I A	
Clubhouse Lake	Burnett	2458000	25	26		SE									INS	
Crescent Lake	Burnett	2458800	36	11		SE	Y	R						77	I A	
Deep Lake	Burnett	2460300	34	58		SE									INS	
Deer Lake	Burnett	2460700	157	23	14	SE		W	CH-C					49	I A	
Deer Lake (17-40-13W)	Washburn	2708900	102	19		DG		NW	S-R					47	I A	
Dubois Lake	Burnett	2461700	71	25	8	SE									INS	
Fawn Lake	Burnett	2464000	30	14		SE									INS	
Ferry Lake	Burnett	2464300	16	36		SE									INS	
Hointville Lake	Washburn	2469400	58	23	10	SE			S-R					42	I A	
Lily Lake (34-41-14W)	Burnett	2475300	187	21	5	SE		BF						54	I A	
Lindy Lake	Burnett	2706700	56	14		SE									II INS	
Loon Lake (22-40-13W)	Washburn	2709400	56	63	25	SE			S-C					32	I A	
Lucerne Lake	Burnett	2480100	40	21		SE	Y	W						38	I A	
Mack Lake	Washburn	2480600	81	13	8	SE	Y	R	S-R					42	I A	

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
McKinley Lake	Washburn	2710100	105	23	12	SE			S-R					49	I A	
Miniature Lake	Burnett	2482800	38	69		SE								40	I A	
Mud Lake (13-40-13W)	Washburn	2484300	15	17		SE								49	I A	
Myrick Lake	Burnett	2485300	19	12		SE		W							I INS	
Perch Lake	Burnett	2488500	16	27		SE									I INS	
Smith Lake	Burnett	2497900	26	22		SE									I INS	
Spring Lake (33-40-13W)	Washburn	2708500	23	24		SP	Y	NW							I A	
Thatcher Lake	Burnett	2501200	23	41		SE									I A	
Tomahawk Lake	Washburn	2501600	24	36		SE								38	I A	
Unnamed Lake (15-41-13W)	Washburn	2567400	45	15		SE								41	I A	
Unnamed (36-40-14W)	Burnett	2707200	61	7		DG	Y	NW							II INS	
Fenton Lake	Burnett	2464100	17	8	15	SE		BR								WLF
Johnson Lake (24-41-15W)	Burnett	2471700	28	7		SE	Y	BR								
Lakeside Lake	Washburn	2473800	32	8	4	SE	Y	T								
Lost Lakes (26-41-14W)	Burnett	2479700	248	4		SE	Y	BR								
Rappy Lake (24-40-13W)	Washburn	2492000	14	15		SE	Y									
Stulen Lake	Burnett	2499700	20	14		SE										
Casey Creek Flowage	Washburn	2708800	99	6		DG	Y	BR							II D	
Cranberry Lake (4-40-14W)	Burnett	2458700	14	2		SE	Y									
Durand Lake	Burnett	2462000	29	6		SE	Y									
Eagle Lake (26-40-14W)	Burnett	2462600	22	3		SE	Y									
Frog Lake (23-41-14W)	Burnett	2465300	22	2		SE	Y	BR								
Goose Lake (21-40-13W)	Washburn	2709300	73	3		SE	Y	W								
Grass Lake	Washburn	2466900	29	4		SE	Y									
Jerry Lake	Washburn	2471100	87	5	3	SE	Y									
Lost Lake (2-39-14W)	Burnett	2707000	21	3		SP	Y									
Meeker Run Lake	Burnett	2481900	18	1		SE		BR								
Oak L (19-41-13W)	Washburn	2486700	92	6	4	SE	Y	T								
Rigler Lake	Washburn	2492500	10	4		SE	Y									
Unnamed Lake (23-40-14W)	Burnett	2556700	25	11			Y									
Unnamed Lake (36-41-14W)	Burnett	2569200	32	4			Y	W								
Wilcox Lake (19-41-12W)	Washburn	2600300	23	7		SE										

Totagatic River Watershed Lakes (SC20)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Bardon Lake (Whitefish Lake)	Douglas	2694000	832	102	30	SE		BF	CH-C	ASSC	PLAN PROT			38-47	I A	
Beartrack Lake	Washburn	2452300	97	36	11	SE		BF	S-R		PLAN-R	XX		42	I A	
Bond Lake	Douglas	2693700	292	64	30	SE		BR	CH-C	ASSC	PLAN-R			34-46	I A	
Gilmore Lake	Washburn	2695800	389	36	16	DG		BR	S-C, CH-R	ASSC	PLAN-R	XX		38	I A	
Kimball Lake, Lower	Washburn	2691800	129	6	4	SE		BR	S-C, CH-R	ASSC	PLAN-R				II	
Kimball Lake, Middle	Washburn	2691900	98	77	31	SE		NW	S-C, CH-R	ASSC	PLAN-R			35	I A	
Kimball Lake, Upper	Washburn	2692000	44	11	5	SE		NW	S-C, CH-R	ASSC	PLAN-R			53-58	II D	
Leader Lake	Douglas	2693800	161	56	22	SE		BW	CH-C	ASSC	PLAN-R			35-50	I A	
McClain Lake	Washburn	2481600	150	30	11	SE		BR	S-R		PLAN			35	I A	
Nancy Lake	Washburn	2691500	772	39	11	SE		BR	S-R, CH-R	ASSC	PLAN PROT-R		EM-W	36-56	I A	
Nelson Lake	Sawyer	2704200	2503	33	11	DG		BR	S-R	ASSC	PLAN-R	XX		57-62	II D	
Red Lake	Douglas	2492100	258	37	11	SE		BR	S-C, CH-R	ASSC	PLAN-R	XX		42-44	I A	
Big Bass Lake	Washburn	2453300	203	27	15	SE		BR	S-R		PLAN-R			47	I A	
Chicog Lake	Washburn	2692200	125	25	15	DG		BR	S-R		PLAN-R				I NS	
Cranberry Lake	Douglas	2693100	172	19	11	DG		BR	S-R	ASSC	PLAN-R				II	
Crystal Lake	Douglas	2459700	288	22	11	SE		BR	S-C, CH-R	ASSC	PLAN-R			47	II A	
Horseshoe Lake (30-42-12W)	Washburn	2470000	194	21	7	SE		BR	S-R		PLAN-R			34	II A	
Minong Flowage	Washburn	2692900	1564	21	9	DG		BFP	CH-C	ASSC	PLAN-R	XX		50-62	II B	
Pokegama Lake	Washburn	2696300	453	23	10	DG		BR	S-R		PLAN-R				II	
Totagatic Flowage	Washburn	2703500	393	12	3	DG	Y	BR							INS	
Colton Flowage	Washburn	2702100	58	22	8	DG	Y	R						49-54	II A	WLF
Derosier Lake	Washburn	2460900	109	11	6	SE	Y	BR	S-R					47	II A	
Frahm Lake	Douglas	2699400	60												?	
Halfway Lake	Douglas	2503500	97	31				BR	S-R					42	I A	
Lt Bass Lake (5- 41-12W)	Washburn	2475900	73	7	4	SE	Y	NW	S-R						II	
Lt Sand Lake (4- 42-13W)	Washburn	2477700	74	21	12	SE		BR						42	I A	
Middle Lake	Washburn	2482100	21	7		SE	Y	R	S-R	ASSC	PLAN-R				II	
No Mans Lake	Washburn	2486300	70	23	7	SE		BR	S-R					49	I A	
Person Lake	Douglas	2488600	172	12	7	SE		BR	S-C, CH-R	ASSC	PLAN-R			38-63	II B	
Pickereel Lake	Douglas	2489100	58	24		SE		T	S-R					41	I A	
Rice Lake	Washburn	2696000	132	11	5	DG		NW						45	II A	
Sand Lake, Big (5- 42-13W)	Washburn	2495200	198	9	6	SE	Y	BR	S-R					51	II A	
Scovils Lake	Washburn	2495900	66	37	12	SE		BR	S-R					36	I A	
Spring Lake (17- 42-13W)	Washburn	2691200	54	8	2	SP		T							II D	

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Totogatic Lake	Bayfield	2705000	537	7	6	DG		BR								
Twin Lake, North	Washburn	2485900	113	20	6	SE		BR	CH-C	ASSC	PLAN-R			44	II A	
Twin Lake, South	Washburn	2494500	115	29	16	SE		BR	CH-C	ASSC	PLAN-R			35	I A	
Adventure Lake	Washburn	2449100	17	36		SE			S-R					36	I A	
Bass Lake (10-43-12W)	Douglas	2451700	128	27	12	SE		W	S-R					47	I A	
Beginger Lake	Douglas	2452800	11	47					S-R						I NS	
Bennett Lake	Douglas	2453000	30	17		SE			S-R					42	I A	
Bluegill Lake	Douglas	2454100	21	77		SE			S-R						I NS	
Bond Lake	Washburn	2696900	14	33		SP		NW	S-R					47	II A	
Buffalo Lake	Douglas	2694700	42	33		SE			S-R					61	I B	
Clear Lake	Douglas	2457700	36	39					S-R					40	I A	
Cloverleaf Lake	Washburn	2457900	36	16	2	SE	Y	T						49	I A	
Croft Lake	Douglas	2459400	52	16		SE	Y	W						48-54	II A	
Harriet Lake	Douglas	2468000	17	18		SE		T						44	I A	
Loon Lake (27-43-13W)	Douglas	2478900	58	18		SE	Y							41	I A	
Loon Lake (36-43-11W)	Douglas	2479100	41	15		SE	Y							42	II A	
Miles Lake	Washburn	2482200	64	19	7	SE		T						37	I A	
Milny Lake	Sawyer	2482500	14	26		SE									I NS	
Ole Lake	Bayfield	2487000	23	45		SE								51	I A	
Sabin Lake	Sawyer	2494600	16	13		SE								51	I A	
Sleepy Eye Lake	Washburn	2497400	39	10	7	SE	Y	BR	S-R					47-50	II A	
Snake Lake	Douglas	2700300	88	35	15	SE								47	I A	
Snipe Lake	Douglas	2498000	21	20		SE	Y							44	I A	
Unnamed Lake (19-42-13W)	Washburn	2572700	39	17			Y								I NS	
Wagner Lake	Douglas	2599200	21	32		SE		WT						35	I A	
Warner Lake	Washburn	2599600	21	22	8	SE										
Acorn Lake (12-41-13W)	Washburn	2449000	17	11			Y									
Banks Lake	Washburn	2450200	48	7		SE	Y									
Chain Lake, Lower	Douglas	2479800	98	11	5	SE	Y	BR								
Clyde Lake	Douglas	2458100	49	11		SE	Y									
Crooked Lake	Douglas	2459300	32	9		SE	Y	T								
Fish Lake	Washburn	2697900	12	9		SE	Y	T								
Mulligan Lake	Douglas	2700200	77	4	3	DG	Y	BR								
Peterson Lake	Douglas	2488700	33	10		SE	Y									
Sherman Lake	Washburn	2496400	35	11		SE										
Wilcox L, East	Washburn	2462500	31	12	6	SE	Y	R								
Bughouse Lake	Washburn	2455600	17	7		SE	Y									
Chain Lake, Upper	Douglas	2598300	77	5	3	SE	Y	W								
Goose Lake	Douglas	2466600	38	5		SE	Y	T								
Kriede Lake (Twomile Lake)	Douglas	2472700	47	7		SE	Y	T								
Long Lake (11-43-12W)	Douglas	2478400	17	5		SE	Y	T								

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Muck Lake (35-43-12W)	Douglas	2694800	19	5		SE	Y	W								
Mud Lake (7-42-13W)	Washburn	2484500	46	4	3	SE	Y	WT								
Onemile Lake	Douglas	2487300	39	6		SE	Y	T								
Rainy Lake	Washburn	2491900	15	11		SE	Y	BR								
Richart Lake	Burnett	2492400	17	3		SE	Y	W								
Round Lake (35-42-12W)	Washburn	2493800	17	7		SE	Y									
Sawyer Lake	Douglas	2700500	12	11		SE	Y	W								
Sullivan Lake	Douglas	2695500	81	8	4	SE	Y	W								
Taylor Lake	Washburn	2698000	11	8	7	DG	Y	BR								
Tucker Lake	Washburn	2502700	26	7		SE	Y									
Unnamed Lake (23-41-10W)	Washburn	2562200	27	7		SE	Y	W								
Unnamed Lake (6-42-12W)	Washburn	2571400	87	7		SE	Y	R								
Unnamed Lake (14-43-12W)	Douglas	2581300	31	3		SE	Y									
Unnamed (14-43-12W)	Douglas	2581000	34	4		SE	Y									
Unnamed (20-43-11W)	Douglas	2580100	32	7		SE	Y									
Unnamed (7-43-12w)	Douglas	2580600	31	4		SE	Y	WT								
Wilcox Lake, West	Washburn	2599100	24	8	4	SE	Y									

Trego Lake – Middle Namekagon Watershed Lakes (SC21)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Bass Lake (17-40-10W)	Washburn	2451900	188	35		SE		BR	S-R, CHR	ASSC	PLAN-R	XX		40-50	I A	
Spring Lake (25-40-11W)	Washburn	2498600	211	25	12	SE		BR	S-R, CHR	ASSC	PLAN-R	XX		40-50	I A	
Trego Lake	Washburn	2712000	451	36	11	DG		BR	S-R, CHR	DIST	PLAN			54	II A	
Bean Lake	Washburn	2718500	100	35	16	DG		BR	S-R, CHR	ASSC	PLAN-R				I NS	
Beaver Lake	Washburn	2452600	89	16	8	SE		BR	S-C	ASSC	PLAN-R			44-47	II A	
Chippanazie Lake	Washburn	2722800	58	31	14	DG		BR	S-R					52	II A	
Cranberry Flowage	Washburn	2722400	201	12		DG		BR							II D	
Crystal Lake	Washburn	2714700	29	29		SE	Y	R	S-R					38-77	I B	
Dilly Lake	Washburn	2712800	74	10	5	DG		BR	S-R					58	II D	
Gardner Lake	Washburn	2465500	37	15		SE	Y	R	S-R					47-62	II B	
Gull Lake	Washburn	2719400	511	19	11	DG		BR	S-C, CHR	ASSC	PLAN-R			52	II A	
Potato Lake	Washburn	2714500	222	20	11	SP		BR	S-C, CHR	ASSC	PLAN-R			57	II B	
Spring Lake (12-40-9W)	Sawyer	2724900	220	18	10	DG	Y	R	S-R	ASSC	PLAN-R			49	II A	
Whalen Lake	Washburn	2715900	84	20	13	DG		BR	S-R					51	I A	
Colbroth	Sawyer	2458200	36	12		SE	Y	R							II NS	
Dugan Lake	Washburn	2714200	53	35	14	DG	Y		S-R					43-54	I A	
Green Lake	Washburn	2467100	29	30		SE			S-R					62	I D	
Hay Lake	Washburn	2720800	79	9	6	DG		T						47	II A	
Little Spring Lake	Sawyer	2724600	13	8		SP	Y	NW								
Loon Lake (10-40-10W)	Washburn	2478800	19	18		SE	Y							45	I A	
Phipps Lake	Sawyer	2489000	10	32		SE		None							I NS	
Spring Lake (7-39-11W)	Washburn	2715700	27	6		SP	Y	NW							II NS	
Sugarbush Lake (17-41-10W)	Washburn	2722000	52	20		DG			S-R						I D	
Unnamed Lake (27-39-10W)	Washburn	2542800	30	35											I NS	
Brinkman Lake	Washburn	2455200	19	13		SE	Y	T								
Devils Lake	Washburn	2461000	28	7		SE	Y									
Lost Lake (7-41-10W)	Washburn	2479600	41	10		SE	Y	W								
Mud Lake (21-40-10W)	Washburn	2484200	53	4	3	SE	Y	NW								
Petty Lake	Sawyer	1873800	15	7		SE	Y									
Tranus Lake	Washburn	2721600	175	12	3	DG	Y	BR							48-59	II D
Deep Lake (24-40-11W)	Washburn	2460200	17	10		SE	Y									
Deer Lake (35-41-11W)	Washburn	2460600	22	7		SE	Y									
King Lake	Washburn	2472200	22	6		SE	Y	W								
Lucky Lake (10-39-11W)	Washburn	2480200	11	7		SE	Y									

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Mud Lake (7-40-9W)	Sawyer	2484100	32	4		SE		R								
Stanberry Lake	Washburn	2499100	35	7		SE	Y	W								
Tripp Lake	Sawyer	2502500	57	5		SE										
Unnamed Lake (11-39-11W)	Washburn	2543800	35	4		SE	Y									
Unnamed Lake (35-41-10W)	Washburn	2562800	37	6		SE	Y	W								

Upper Namekagon River Watershed Lakes (SC22)

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter - Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Atkins Lake	Bayfield	2734000	176	80	29	DN		BR	S-C					35-46	I A	
Bass Lake (24-44-6W)	Bayfield	2733600	78	35	7	SE		BR	S-R							
Namekagon Lake	Bayfield	2732600	3227	51	16	DG		BFP	S-C, CHR	ASSC	PLAN	XX		41-51	I A	
Osgood Lake	Sawyer	2728400	4	10		SP		W								
Pacwawong Lake	Sawyer	2728700	160	6	3	DG		BR							II INS	
Pacwawong Springs	Sawyer	2728900	13	14	4	SP		R						47	I A	
Phipps Flowage	Sawyer	2727800	143	13	2	DG		R							II INS	
Hayward Lake	Sawyer	2725500	247	17	5	DG		BRP	S-R		PLAN-R			38-50	II A	
Cable Lake	Bayfield	2729700	166	43	10	DG		BR	S-C, CHR	ASSC	PLAN-R			38-45	I A	
Jackson Lake	Bayfield	27342d00	142	13	8	DG		NW	S-C, CHR	ASSC	PLAN			57	II B	
Perry Lake	Bayfield	2730800	50	19	9	SE		BR	S-R					41	I A	
Phipps Springs	Sawyer	2728100	31	13	3	SP		R						46	II A	
Silverthorn Lake	Sawyer	2497000	18	17	9	SE	Y	BR	S-R					42	I A	
Smith Lake	Sawyer	2726100	323	29	15	DG		BR	S-R						INS	
Taylor Lake	Bayfield	2734100	94	15	6	SE	Y	BR	S-R					49	II A	
Twin Lake, No. (17-43-6W)	Bayfield	2731800	53	25	10	SE		T	S-R					49-50	I A	
Twin Lake, So. (20-43-6W)	Bayfield	2494400	19	20		SE		T	S-R					49	I A	
Wiley Lake	Bayfield	2729800	59	25	10	DG		NW	S-C, CHR	ASSC	PLAN-R			45	I A	
Big Brook	Bayfield	2730400	34	24	11	SP		T						49	I A	
Club Lake	Bayfield	2733900	83	22		SE		WT	S-R, S-R					51	I A	
Cranberry Lake (34-44-6W)	Bayfield	2732800	58	20		SE			S-R					44-51	I A	
Frels Lake	Bayfield	2465100	11	18		SE	Y								INS	
Friebaur Lake	Bayfield	2734900	21	18		SE	Y							44-51	I A	
Half Moon Lake (24-44-8W)	Bayfield	2472900	15	17		SE	Y								INS	
Hammil Lake	Bayfield	2467900	83	50	20	SE			S-C, CHR		PLAN-R			35-63	I A	
Henry Lake	Bayfield	2729500	29	28		SE									INS	
Hidden Lake	Bayfield	2469000	34	15		SE	Y	W							INS	
Holly Lake	Bayfield	2473000	15	16		SE	Y	W						41	I A	
Joann Lake	Bayfield	2732200	12	14		SP		T						41	I A	
Knottling Lake	Bayfield	2734700	80	13		SE		W						42	II A	
Lerche Lake	Bayfield	2475200	18	37		SE	Y								INS	
Little Bass Lake	Bayfield	2735200	43	13		SE	Y	R							II INS	
Little Round Lake(9-41-9W)	Sawyer	2477500	22	18		SE		NW							INS	
Picture Lake	Bayfield	2489300	58	8	4	SE	Y	T						44	II A	
Porter Lake (N. Porter)	Bayfield	2731300	26	33		SE			S-R						INS	
Price Lake	Bayfield	2491300	74	16	8	SE	Y		S-R					38-50	II A	
Rock Lake	Bayfield	2492800	33	25		SE		W	S-R						INS	
Rosa Lake	Bayfield	2493200	43	39		SE			S-R					35	I A	
Samoset Lake	Bayfield	2494800	46	40		SE			S-R					34-45	I A	
South Porter Lake	Bayfield	2731200	12	20		SE									INS	
Stewart Lake	Bayfield	2499400	24	20		SE		W						42	I A	

Lake Name Location (T-R-S)	County	Waterbody ID Code	Surface Area (Acres)	Depth (feet)		Lake Type	Winter- Kill	Access	Self Help Monitoring	LakeM gt. Org.	Lake Grants	Hg	Mac	TSI	P Sens	Comments
				Max	Mean											
Trapper Lake	Bayfield	2734500	84	31	16	SE		W	S-R					57	I A	
Wilipyo Lake	Bayfield	2473600	77	25		SE			S-R					38	I A	
Bullhead Lake (29-44-5W)	Bayfield	2456000	36	11		SE	Y	W								
Indian School L	Sayer	2726000	46	6		DG		BR								
Sixteen Lake (16- 44-8W)	Bayfield	2473400	34	10		SE	Y	W							II INS	
Camp Lake	Bayfield	2456400	13	8		SE	Y	T								
Dawn Lake	Bayfield	2460000	10	12		SE	Y									
Dinner Camp Lake	Bayfield	2472800	14	5		SE	Y	W								
Holmes Lake	Bayfield	2735000	13	3		SP	Y	W								
Lizzie Lake	Bayfield	2896800	17	5			Y	W								
Smear Lake	Bayfield	2497600	14	4		SE	Y	W								
Unnamed Lake (10-41-8W)	Sawyer	2727600	248	7		DG		T								
Unnamed Lake (9- 41-8W)	Sawyer	2727400	43	7		DG										

Appendix D. Stream Table Quick Reference

Streams of Kinnickinnic River Watershed (UC01)

[illegible]

Appendix E. Stream Tables

Streams of Kinnickinnic River Watershed

WATERSHED – Kinnickinnic River Streams - SC01 239.5										COUNTIES: Pierce, St. Croix			SQUARE MILES:			Population:			
Stream Name	WBID	Miles	Biol. Use/miles		Potential Biol. Use/miles	Integrity Indicator	Biological Use ³ Support/miles ----- Other use/miles	Assessed M, E, U / miles	Class ^j	Use Impairment in Miles ⁹ Source / Contribution Stressor ^h / Contribution		Trend ⁴ / Miles	Com. ⁱ	Data Level ^k	Ref.				
Kelly Creek	2604600	1	Cold II/1	Cold I/1	--HAB/F IBI-C/G--	PART/1		M/1	Cold II	CL,CON - 1/Ma	SED - 1/Mo	I	N	P2,H 4,B4	1, 3				
Kinnickinnic River	2601800	42	Cold II/25	Cold I/25	--HAB/G IBI-C/G	THR/12 PART/13		M/25	ORW/Cold I	HMI,CL,SB, URB,DEV,P SM,NPS - 42/Ma	SED,HAB, FLOW - 42/Ma	S	N,R	P2,H 4,B4	1,6,7				
Tributary to S. Br. Kinnickinnick R.	2605400	<1	U/<1	U/<1	--	U/<1		U/<1											
S. Br. Kinnickinnick R.	2603190 0	9	Cold II/5	Cold I/5	--HAB/F IBI-C/F	PART/5		M/5	Cold II	BDAM,SB,U RB,DEV,NP S-9/Ma	FLOW, TEMP, HAB, SED- 9/Ma	S	N,R	P2,H 4,B4	1, 4				
Nye Creek	2604500	3	Cold II/3	Cold I/3	--HAB/G IBI-C/E	PART/3		M/3	Cold II	NPS-2/Mo	HAB, SED- 2/Ma		N	P2,H 4,B4	1,4				
Parker Creek	2604700	6	Cold I/3 ColdIII/2	Cold I/5	--HAB/F IBI-C/F	PART/5		M/5	ERW/Cold I	SB,PSB,BY, FLD, NPS/6-Mo	TEMP,NUT, HAB, SED- 6/Mo	I	N	P2,H 4,B4	1, 5				
Rocky Branch	2602400	6	Cold I/2	Cold I/2	--HAB/G IBI-C/F	PART/2		M/2	ERW/Cold I	SB,DEV,UR B, CON/- 6/Mo	HAB, SED- 6/Mo	D	N	P2,H 4,B4	1,4				
St. Croix River	2601400	18	WWSF/18	WWSF/1 8	--	THR/6		M/18	ERW/DEF	NPS-18/Mo	HAB, FAD- 18/Mo		N		1				
Ted Creek	2604400	2	Cold II/1	Cold I/1	--HAB/F IBI-C/E	PART/1		M/1		PSB, CL- 2/Mo	SED,HAB- 2/Mo	S	R	P2,H 4,B4	1, 9				
Unnamed Creeks		79																	

Streams of Lower Willow River Watershed

WATERSHED - Lower Willow Watershed - SC02				COUNTIES: St. Croix		SQUARE MILES: 115.1		Population:					
Stream Name	WBID	Miles	Biol. Use/miles	Potential Biol. Use/miles	Integrity Indicator	Biological Use ³ Support/miles	Assessed M, E, U / miles	Class ^j	Use Impairment in Miles ^g Source / Contribution Stressor ^h / Contribution	Trend ^d / Miles	Com. ⁱ	Data Level ^k	Ref.
Paperjack Cr.	2608500	7	WWFF/7	WWFF/7	-HAB/F IBI-W/P-	PART/7	M/7	DEF	BY,URB,DEV - 7/Mo	S	N	P2, B4,H4	4, 8
St. Croix River	2601400	11	WWSF/11	WWSF/11	--	THR/11	M/42	ORW, ERW/DEF	NPS, URB, CON-11/Ma		N		1, 2
Tennile Cr.	2607900	10	WWFF/7.4 Cold II/2.6	WWFF/7.4 Cold II/2.6	HAB/G IBI-W/P IBI-C/V/P	PART/7.4 PART/2.6	M/10	Cold II/2.6	PSB-10/Mo	S	N	P2,B4 ,H4	1, 2
Willow R.	2606900	13	ColdII/6.2 Cold II/3.1 WWSF/3.7	Cold I/3.1 Cold III/6.2 WWSF/3.7	HAB/F IBI-C/F IBI-W/F-	THR/21	M/13	ERW/Cold I/2.3 Cold II	URB, NPS,HM,BY ,DEV,PSM, PSI -13/Ma	D	N	P2,B4 ,H4	6, 7
Willow R. Race Branch	2607200	1	Cold II/1	Cold II/1	-HAB/F IBI-C/F	THR/1	M/1	Cold II	NPS,RB,1/Mo	D	N	P2,B4 ,H4	3, 5
Anderson Springs		>1	ColdII/0.2	ColdII/0.2				ColdII					
Hennessey Springs		>1	ColdII/0.5	ColdII/0.5	HAB/G IBI-C-P	PART/0.5	M/1		HM	U		P2,B4 ,H4	
Un. Creeks	Various	9											

Streams of Upper Willow River Watershed

WATERSHED Upper Willow River Watershed - SC03				COUNTIES: St. Croix, Polk			SQUARE MILES: 173.3			Population:			
Stream Name	WBID	Miles	Biol. Use/miles	Potential Biol. Use/miles	Integrity Indicator	Biological Use ³ Support/miles ----- Other use/miles	Assessed M, E, U / miles	Class ¹	Use Impairment in Miles ⁹ Source / Contribution Stressor ⁷ / Contribution	Trend ⁴ / Miles	Com. ¹	Data Level ^k	Ref.
Willow River	2606900	43	WWSF/3.5 Cold II/11.5 Cold III/9.0 WWFF/8	WWSF/3.5 5 Cold II/20.5 WWFF/8	HAB/F IBI-C/P IBI-W/F-	PART/32	M/32	DEF-10 Cold -14.8 DEF-10	NPS-43/Mo HAB, TEMP, DO-43/Ma	S		P2 ,B4,H4	1
S. Fk. Willow	2609200	16	Cold II/5.3	Cold I/3.0 Cold/2.3	--HAB/F IBI-C-F	PART/5.3	M/5.3	Cold -5.3	NPS-16/Mo HAB, SED, TEMP-16/Mo	I		P2,B4, H4	1
Dry Run	2609300	2 12	WWFF/2 UNK UNK	WWFF/2 UNK UNK	-HAB/F IBI-C/P-	PART/2 UNK UNK	M3	UNK	CL,SB,BY HAB	U		H4 P2,B4	
Carr Cr.	2609900	8	UNK	UNK	--	UNK		UNK					
Hutton Cr.	2610900	1 2 10	Cold II/1.0 WWFF/2	Cold II/1.0 WWFF/2	--HAB/G IBI-C/P	PART/1.0 PART/2.0	M/3	UNK	BY, SB,NPS-14/Mo HAB, TEMP-14/Mo	U		P2,B4, H4	1
Black Brook	2611700	3 6	WWFF/3 WWSF	WWFF/3 UNK	--HAB/G IBI-W/F	PART/3 UNK	M/3 E/6	UNK	NPS-9/Mo HAB-9/Mo	U		P2,B4, H4	1
Wolf Cr.	2612300	5	UNK	UNK	--	UNK		UNK					
Jack Green Cr.	2612700	3	UNK	UNK	--	UNK		UNK					
Unnamed Creeks	Various	71	UNK	UNK	--	UNK		UNK					

Streams of Lower Apple River Watershed

WATERSHED - Lower Apple River Watershed - SC04				COUNTIES: Polk			SQUARE MILES:			Population:			
Stream Name	WBID	Miles	Biol. Use/miles	Potential Biol. Use/miles	Integrity Indicator	Biological Use ³ Support/miles ----- Other use/miles	Assessed M, E, U / miles	Class ¹	Use Impairment in Miles ⁹ Source / Contribution Stressor ^h / Contribution	Trend ⁴ / Miles	Com. ¹	Data Level ^k	Ref.
St. Croix River	2601400	4	WWSF/4	WWSF/4		Fully/Thr	E/4	ORW/DEF	FAD	U/4		H1	
Apple River	2614000	43	COLD/4 COLD III/4 WWSF/35	COLD II/4 COLD III/4 WWSF/35	P	Fully	E/43	COLD/8, DEF/35	NUT	U/43	N/R	H1	
Cedar Creek		1						DEF					
Horse Creek	2615200	17	WWFF/17	WWFF/17	P	Fully	E/17	DEF	BY, CL, SB HAB, NUT	U/17	N/R	B3, H3, P3	
Rice Creek	2615300	1	WWFF/1	WWFF/1		Fully	E/1	DEF		U/1			
Forest Creek	2615500	1	UNK	UNK				DEF					
Marlpit Creek	2616500	1	COLD/1	COLD/1		Fully	E/1	DEF		U/1		H1	
Behning Creek	2616800	1	COLD I/1	COLD I/1		Fully-Thr	E/1	COLD/1	B DAM HAB	U/1		H1	
Spring Brook		1	UNK	UNK				DEF					
Peabody Creek	2617300	1	COLD I/1	COLD I/1		Fully-Thr	E/1	COLD, DE F	B DAM HAB, TEMP	U/1		H1	
Parker Creek	2621700	2	COLD III/2	COLD III/2		Fully-Thr	E/2	COLD	HAB	U/2	R	H1	
Bull Brook	2622000	11	COLD III/3 WWFF/8	COLD III/3 WWFF/8		Part	E/11	COLD, DE F	HAB, NUT CL, SB, BY	U/11	N/R	H1	
Snake Creek	2622600	2	WWFF/2	WWFF/2		Fully	E/2	DEF	HAB SB, CL	U/2		H1	
French Creek	2623000	3	WWFF/3	WWFF/3		Fully	E/3	DEF	HAB SB, CL	U/3		H1	
Unnamed Creeks		10	WWFF/10	WWFF/10		UNK	U/10			U/10			

Streams of Balsam Branch Watershed

WATERSHED - Balsam Branch Streams – SC05					COUNTIES: Polk		SQUARE MILES:			Population:			
Stream Name	WBID	Miles	Biol. Use/miles	Potential Biol. Use/miles	Integrity Indicator	Biological Use ³ Support/miles Other use/miles	Assessed M, E, U / miles	Class ^l	Use Impairment in Miles ⁹ Source / Contribution Stressor ^h / Contribution	Trend ⁴ / Miles	Com. ⁱ	Data Level ^k	Ref.
Balsam Br.	2618300	11	WW/SF/8 COLD III/3	WW/SF/8 COLD III/3		Part	E/11	Cold III-3 DEF-8	CL	HAB/TEMP	U/11	N/R	H1
Toby Cr.	2619000	3	COLD I/3	COLD I/3		Fully-Thr	E/3	COLD I	B DAM	HAB, TEMP	U/3		H1
Deer Cr	2619200	1	WW/FF/1	WW/FF/1		Fully	E/1	DEF			U/1		H1
Rock Cr.	2619500	1	WW/FF/1	WW/FF/1		Fully	U/1	DEF	CL,BY	NUT	U/1		H1
Harder Cr.	2620900	6	WW/FF/6	WW/FF/6		Part	E/6	DEF	CL	NUT	U/6	N	H1
Rice Cr.	2621200	4	WW/FF/4	WW/FF/4		Part	E/4	DEF	CL,SB	HAB,NUT	I/4	N	?
Otter Cr.	2621300	3	WW/FF/3	WW/FF/3		Fully	U/3	DEF			U/3		
Wapogasset Brook	2617700	5	WW/FF/5	WW/FF/5		Part	E/5	DEF	SB,CL	HAB	U/5	R	H1
Friday Cr.	2618200	3	COLD II/3	COLD II/3		Part	E/3	COLD/3	CL,SB, BDAM	HAB, TEMP	U/3	N/R	H1
Unnamed Creeks		3	WW/FF/3	WW/FF/3		UNK	U/3	DEF			U/3		

Streams of Upper Apple River Watershed

WATERSHED - Upper Apple River Watershed - SC06					COUNTIES: Barren, Polk			SQUARE MILES:			Population:			
Stream Name	WBID	Mile s	Biol. Use/miles	Potential Biol. Use/miles	Integrit y Indicat or	Biological Use ³ Support/miles Other use/miles	Assesse d M, E, U / miles	Class ^l	Use Impairment in Miles ⁹ Source / Contribution Stressor ^h / Contribution	Trend ^d / Miles	Com. ⁱ	Data Level ^k	Ref.	
Apple R	2614000	36	WWSF/15 WWFF/21	WWSF/15 WWFF/21	--	Part	E/36	DEF	BY, CL, SB SED, NUT	U/36	N, R	H1	1	
Burns Cr.	2626100	2	COLD I/2	COLD I/2	--	Part	E/2	COLD I	CL, SB SED	U/2	R	H1	1	
Markee Cr.	2626200	1	COLD I/1	COLD I/1	--	Fully-Thr	E/1	COLD I	B DAM TEMP, HAB	U/1	R	H1	1	
Apple R. - N Channel	2626600	1	WWSF/1	WWSF/1	--	Fully	E/1	DEF		U/1		H1		
Fox Cr.	2626800	8	WWFF/8	WWFF/8		Part	E/8	DEF	CL, SB SED, HAB, NUT	U/8	R	H1	1	
Straight R.	2626900	15	COLD II/1 WWFF/14	COLD II/1 WWFF/14	--	Part	E/15	COLD II	CL, SB SED, HAB, NUT	U/15	R	H1	1	
Lost Cr.	2627100	1	WWFF/1	WWFF/1	--	Fully	U/1	DEF	CL, SB SED	U/1	R			
Evelyn Cr.	2627500	1	WWFF/1	WWFF/1	--	Fully	U/1	DEF	CL, SB SED	U/1	R		1	
Prokor Cr.	2628200	1	WWFF/1	WWFF/1	--	Fully	U/1	DEF	CL, SB SED	U/1	R		1	
Rice Bed Cr.	2628900	7	COLD II/2 WWFF/5	COLD II/2 WWFF/5		Fully-Thr	E/7	COLD II	BDAM TEMP, HAB	U/7		H1		
Staples Cr.	2631900	8	WWFF/8	WWFF/8		Fully	E/8	DEF	CL, SB SED, NUT	U/8	R	H1		
Unnamed Creeks		30	COLD II/1 WWFF/29	COLD II/1 WWFF/29		UNK	U/30	DEF	CL, SB SED	U/30				

Streams of Beaver Brook Watershed

WATERSHED Beaver Brook SC07				COUNTIES: Barren, Polk		SQUARE MILES:			Population:					
Stream Name	WBID	Miles	Biol. Use/miles	Potential Biol. Use/miles	Integrity Indicator	Biological Use ³ Support/miles ----- Other use/miles	Assessed M, E, U / miles	Class ^j	Use Impairment in Miles ⁹ Source / Contribution Stressor ^h / Contribution		Trend ⁴ / Miles	Com. ⁱ	Data Level ^k	Ref
Beaver Brook	2624300	12	WWFF/12	WWFF/12		Fully	E/12	DEF	CL, SB	SED, NUT	U/12	N/R	H1	
S. Br. Beaver Br.	2624400	10	WWFF/10	WWFF/10		Fully	E/10	DEF	CL, SB	SED, NUT	U/10	R	H1	
Nepadoggen Cr.	2624500	6	WWFF/6	WWFF/6		Fully	U/6	DEF	CL, SB	SED, NUT	U/6	R	H1	
Clayton Brook	2625100	3	WWFF/3	WWFF/3		Fully	U/3	DEF	CL, SB	SED, NUT	U/3	R		
N. Br. Beaver Br.	2625500	14	WWFF/14	WWFF/14		Fully	E/14	DEF	CL, SB	SED, HAB, NUT	U/14	R	H1	
Unnamed Creeks		3	WWFF/3	WWFF/3		Fully	U/3	DEF			U/3			

Streams of Trout Brook (Osceola Creek) Watershed

COUNTIES: Polk, St. Croix										Population:			
WATERSHED Trout Brook (Osceola Creek) Watershed - SC08						SQUARE							
MILES:													
Stream Name	WBID	Miles	Biol. Use/miles	Potential Biol. Use/miles	Integrity Indicator	Biological Use ³ Support/miles ----- Other use/miles	Assessed M, E, U / miles	Class ^j	Use Impairment in Miles ⁹ Source / Contribution Stressor ^h / Contribution	Trend ^d / Miles	Com. ⁱ	Data Level ^k	Ref.
St. Croix R.	2601400	21	WWSF/21	WWSF/21	--	FULLY/THR	M	ORW-14 ERW-7	HM-21/Mo	U/21	N		2, 3
Osceola Cr.	2632700	6	COLD II/1 COLD III/3 WWFF/2	COLD I/1 COLD II/3 WWFF/2	--	PART	E/6	DEF	CL, SB	S/6	N, R	?	1
Unnamed Creeks		4	WWFF/4	WWFF/4		UNK	U/4	DEF		U/4			

Streams of Wolf Creek Watershed

WATERSHED Wolf Creek Watershed SC09				COUNTIES: Polk		SQUARE MILES:			Population:					
Stream Name	WBID	Miles	Biol. Use/miles	Potential Biol. Use/miles	Integrity Indicator	Biological Use ³ Support/miles Other use/miles	Assessed M, E, U / miles	Class ^j	Use Impairment in Miles ⁹ Source / Contribution Stressor ^h / Contribution		Trend ⁴ / Miles	Com. ⁱ	Data Level ^k	Ref.
St. Croix R.	2601400	13	WWSF-13	WWSF-13	--	FULLY/THR	M	ORW-13	HM-13/Mo	HAB, FAD-13/Mo	U	N		2, 3
Vermont Cr.	2634450	1	WWFF/1	WWFF/1	--	FULLY	U/1	DEF			U/1			1
Big Rock Cr.	2634500	5	COLD I/5	COLD I/5	--	PART	E/5	COLD I	HM, CL, SB, B DAM	TEMP, HAB, SED, NUT	U/5		H1	
Wolf Cr.	2635200	13	COLD I/1 COLD II/2 WWFF/10	COLD I/1 COLD II/2 WWFF/10	--	PART	E/13	COLD	CL, SB - 13/Mo	SED-13/Mo	U/13	R	H1	
Marsh Cr.	2635300	1	WWFF/1	WWFF/1		FULLY	U/1	DEF			U/1			
Orr Cr.	2635500	3	WWFF/3	WWFF/3	--	FULLY	U/3	DEF			U/3			
Unnamed Creeks		2	WWFF/2	WWFF/2	--	FULLY	U/2	DEF			U/2			

Streams of Trade River Watershed

WATERSHED - Trade River Watershed SC10				COUNTIES: Burnett, Polk			SQUARE MILES:			Population:			
Stream Name	WBID	Miles	Biol. Use/miles	Potential Biol. Use/miles	Integrity Indicator	Biological Use ³ Support/miles	Assessed M, E, U / miles	Class ^j	Use Impairment in Miles ⁹ Source / Contribution Stressor ^h / Contribution	Trend ^d / Miles	Com. ⁱ	Data Level ^k	Ref.
St. Croix R.	2601400	22	WWSF/22	WWSF/22	--	FULLY/THR	M	ORW	?	FAD-22/Mo	U	R	3, 4
Cold Cr.	2636300	1	COLD II/1	COLD II/1	-	FULLY	E/1	COLD II			U/1		H1
Cowan Cr.	2636100	13	COLD II/3 WWFF/10	COLD II/3 WWFF/10	--	FULLY	E/1	COLD II	B DAM	HAB, TEMP	U/13		H1
Trade R.	2636000	51	COLD III/14 WWFF/37	COLD III/14 WWFF/37	--	PART	E/51	COLD-14 DEF-37	CL, SB-51/Mo	SED-51/Mo NUT	U	R	H1
North Cr.	2636700	2	COLD III/2	COLD III/2		FULLY	E/51	COLD III	SB-2/Mo	SED	U	R	
Logging Cr.	2636800	7	WWFF/7	WWFF/7	--	FULLY	U/7	DEF			U		
N. Fork Trade R.	2637400	14	COLD III/ 3 WWFF/11	COLD III/3 WWFF/11	--	PART		COLD-7 DEF-7	PSB, BDAM-14/Mo	HAB-14/Mo	U	R	
Butternut Cr.	2640600	10	WWFF/10	WWFF/10	-	PART	E/10	DEF	CL, SB-10/Mo	SED-10/Mo NUT	U/10	R	H1
Hanes Cr.	2641300	4	WWFF/4	WWFF/4	--	FULLY	U/4	DEF			U		
S. Br. Trade R.	2641600	2	COLD II/2	COLD II/2		FULLY	E/2	COLD II-2	SB-2/Mo	SED-2/Mo	U/2	R	H1
N. Star Cr.	2641700	2	WWFF/2	WWFF/2		FULLY	U/2	DEF			U		
Brown Brook	2641800	3	WWFF/3	WWFF/3		FULLY	U/3	DEF	CL, SB-2/Mo	SED-2/Mo	U/3	R	
Lagoo Cr.	2642400	2	COLD II/2	COLD II/2		FULLY	E/2	COLD II			U/2		
Benson Brook	2642800	2	COLD I/.5 LLF/1.5	COLD I/.5 LLF/1.5		FULLY	U/2	COLD			U		
Unnamed Creeks		25				UNK							

Streams of Wood River Watershed

WATERSHED – Wood River Watershed – SC11					COUNTIES: Burnett, Polk			SQUARE MILES:			Population:				
Stream Name	WBID	Miles	Biol. Use/miles	Potential Biol. Use/miles	Integrity Indicator	Biological Use ³ Support/miles Other use/miles	Assessed M, E, U / miles	Class ^j	Use Impairment in Miles ⁹ Source / Contribution Stressor ^h / Contribution		Trend ^d / Miles	Com. ⁱ	Data Level ^k	Ref.	
St. Croix River	2601400	22	WWSF-22	WWSF-22		FULLY/THR	M	ORW	SED/22	HAB-22	S/22	R			
Wood River	2642900	50	WWSF -14 WWFF -36	WWSF -14 WWFF -36		PART	U/50	DEF	PSB/22, EX/10 HM/10	HAB/22, TURBO/10	U/52	R	H1		
Hay Creek	2643000	8	COLD II/1 LFF/7	COLD II/2 WWFF/6		NOT	E/1	ERW DEF/6	PSB/8,EX-8, SB, HM/8	HAB/8, TURB/8, FLOW/8	D/8	R	H2		
Phantom L. Bypass	2644200	3	LFF-3	LFF-3		FULLY	U/3	DEF			U/3				
Refuge Bypass	2645000	1	LFF-1	LFF-1		FULLY	U/1	DEF			U/1				
Whiskey Creek	2646600	1	LFF -1	LFF -1		FULLY	U/1	DEF			U/1				
N. F. Wood River	2647000	17	WWFF	WWFF		FULLY	U/17	DEF	PSB/17	HAB/17	U/17	R			
Pumphouse Ditch	2647400	1	LFF -1	LFF -1		FULLY	U/1	DEF			U/1				
Spirit Creek	2649900	11	WWFF/11	WWFF/11		FULLY	U/11	DEF			U	R			
Pine Brook	2652800	1	COLD I/1	COLD I/1		FULLY	E/1	ERW	BDAM/1		U		H1		
East Brook	2652900	1	COLD I/1	COLD I/1		FULLY	E/1	ERW	BDAM/1	HAB/1	U		H1		
Brant Brook	2653000	1	COLD I/1	COLD I/1		FULLY	E/1	ERW	BDAM/1	HAB/1	U		H1		
Kettle Brook	2653100	1	COLD I/1	COLD I/1		FULLY	E/1	ERW	BDAM/1	HAB/1	U		H1		
Bear Brook	2653200	1	COLD I/1	COLD I/1		FULLY	E/1	ERW			U				
Ekdall Brook	2653300	1	COLD I/1	COLD I/1		FULLY	E/1	ERW	BDAM/1	HAB/1	U		H1		
Iron Creek	2653700	3	WWFF/3	WWFF/3		FULLY	U 3	DEF			U				
Unnamed Creeks		35				UNK									

Streams of Clam River Watershed

WATERSHED – Clam River Watershed – SC12					COUNTIES: Barron, Burnett, Polk			SQUARE MILES:			Population:			
Stream Name	WBID	Miles	Biol. Use/miles	Potential Biol. Use/miles	Integrality Indicator	Biological Use ³ Support/miles ----- Other use/miles	Assessed M, E, U / miles	Class ¹	Use Impairment in Miles ⁹ Source / Contribution Stressor ^h / Contribution		Trend ⁴ / Miles	Com. ¹	Data Level ^k	Ref.
Clam River	2654200	66	WWSF/43 COLD i/8 COLD iii/10 WWFF/5	WWSF/43 COLD i/8 COLD iii/10 WWFF/5		PART	M/66	COLD/18, ORW/38	EX,CL,SB/66, BDAM/8	SED/66, TEMP, HAB, NUT	S/66	R	H3, B3, P3	
Clam River S. Channel	2654300	4	COLD I/4	COLD I/4		FULLY	M/4	COLD I/1	BDAM/1	HAB, TEM P/1				
Dody Brook	2654600	2	COLD II/1 COLD I/1	COLD II/1 COLD I/1		THREATENED	U/2	COLD	BDAM/2 DEV/1	HAB, TEMP	I/2	R	H1	
Black Brook	2654800	4	COLD II/2 WWFF/2	COLD II/2 WWFF		FULLY	E/4	ERW				R		
Gillespie Creek	2664600	9	WWFF/9	WWFF/9		FULLY	E/9	DEF			U/9		H1	
Knapp Creek	2665400	8	COLD I/1 WWFF/7	COLD I/1 WWFF/7		PART	E/8	DEF	PSB/8	SED, NUT	U/8	R	H1	
Somers Creek	2665800	9	WWFF/9	WWFF/9		FULLY	E/9	DEF			U/9		H1	
Maple Valley Cr.	2666500	2	WWFF/2	WWFF/2		FULLY	U/2	DEF			U/2			
McKenzie Creek	2666600	7	COLD I/4 COLD II/2 WWFF/1	COLD I/4 COLD II/2 WWFF/1		FULLY	E/1 M/6	ORW	B DAM/7	HAB, TEMP	S/7	R	H3, B3, P3	
Little McKenzie Cr.	2666700	1	COLD I/1	COLD I/1		PART	E/1	COLD I	BDAM/1	HAB, TEMP	S/1		H1	
Mohnson Creek	2667000	2	COLD II/2	COLD II/2		PART	E/2	COLD II	B DAM/2	HAB, TEMP	S/2		H1	
McKinley Creek	2667500	2	COLD II/2	COLD II/2		FULLY	E/2	COLD II			U/2		H1	
Largon Creek	2667800	5	WWFF/5	WWFF/5		FULLY	E/5	DEF	SB,CL/5	SED/5, NUT	U/5	R	H1	
Lamont Creek	2668300	1	WWFF/1	WWFF/1		FULLY	U/1	DEF			U/1			
Sucker creek	2668700	5	WWFF/5	WWFF/5		FULLY	U/5	DEF			U/5	R		
Unnamed Creeks		22				UNK								

Streams of North Fork Clam River Watershed

WATERSHED North Fork Clam River Watershed SC13 SQUARE MILES:										COUNTIES: Barron, Burnett, Polk, Washburn				Population:			
Stream Name	WBID	Miles	Biol. Use/miles	Potential Biol. Use/miles	Integrity Indicator	Biological Use ³ Support/miles ----- Other use/miles	Assesse d M, E, U / miles	Class ¹	Use Impairment in Miles ⁹ Source / Contribution Stressor ^h / Contribution	Trend ^d / Miles	Com. ⁱ	Data Level ^k	Ref.				
N. Fk. Clam R.	2656600	41			IBI=G		M/1/2	ORW, COLD/26, DEF/15	BDAM, PSB HAB	U/41	R	H2, P2, B3					
Kent Cr.	2656700	1								U/1							
Indian Cr.	2657800	10	WWFF/7 COLD II/3	WWFF/7 COLD II/3		FULLY TH/3	U	ORW/3 DEF/7	PSB TURB, HAB FLOW	U/10	R	H1					
Spencer Cr.	2658600	2	WWFF/1 COLD I/1	WWFF/1 COLD I/1		FULLY	U	ORW DEF 1		U/2	R						
Sand Cr.	2659400	20	COLD I/5 COLD II/5	COLD I/5 COLD II/5	IBI=G	FULLY	M/1/4. E/20	ORW/	B DAM HAB, TEMP	S/20	R	H2, P2, B3					
Spring Brook	2659500	4	COLD I/4	COLD I/4		TH/1	U	ORW	BDAM HAB		R	H1					
Ore Creek	2635500	4	COLD II/1 WWFF/3	COLD II/1 WWFF/3		FULLY	E/4	ORW/1, DEF/3	BDAM HAB, TEMP	S/4	R	H1					
Bashaw Outlet	2662000	2	WWSF/2	WWSF/2		PART	U	DEF	BY, PSB HAB, SED	U/2	R						
Montgomery Cr.	2662100	6	COLD I/1 COLD 2/3 WWSF/2	COLD I/4 WWSF/2	IBI =P	TH/3	M/1/4	ORW	PSB SED, HAB	U/6	R	H2, P2, B3					
Bashaw Brook	2662500	9	WWSF	WWFF/7 COLD I/2	IBI =P	FULLY	M/1/4	DEF	BDAM, SB HAB	U/9	R	H2, P2, B3					
S. Fk. Clam R.	2663300	6	COLD I/4 WWFF/2	COLD I/4 WWFF/2	IBI = G	FULLY	M/1/4	ORW		S/6	R	H2, P2, B3					
Krantz Cr.	2663700	1	COLD I/1	COLD I/1		FULLY	E/1	ORW		U/1	R						
Unnamed Creeks		41				UNK				U/41							

Streams of Lower Yellow River Watershed

WATERSHED - Lower Yellow River Watershed SC14					COUNTIES: Burnett		SQUARE MILES:			Population:				
Stream Name	WBID	Miles	Biol. Use/miles	Potential Biol. Use/miles	Integrity Indicator	Biological Use ³ Support/miles Other use/miles	Assessed M, E, U / miles	Class ^j	Use Impairment in Miles ⁹ Source / Contribution Stressor ^h / Contribution	Trend ^d / Miles	Com. ⁱ	Data Level ^k	Ref.	
St. Croix R.	2601400	14	WWSF	WWSF		FULLY/14	E/14	ORW		U/14	R			
Sioux Portage Cr.	2669500	1	COLD I/1	COLD 1/1		FULLY/1	E/1	ERW	BDAM	U/1		H1		
Yellow R.	2670300	41	WWSF	WWSF		FULLY/41	E/41	DEF		U/41	R			
Loon Cr.	2670400	17	WWFF	WWFF		FULLY/17	E/2	DEF		U/17	R			
Culbertson Cr.	2672900	3	WWFF	WWFF		FULLY/3	U	DEF		U/3				
Yellow R. B W. Channel	2674300	<1	WWSF	WWSF		FULLY<1	U	DEF		U/1				
Spring Brook	2677300	2	COLD I/2	COLD I/2		FULLY2	E/2	ERW		U/2	R			
Black Creek	2677800	2	COLD I/2	COLD I/2		FULLY2	E/2	ERW		U/2	R			
Unnamed Creeks		32				UNK				U/32				

Streams of Shell Lake and Upper Yellow River Watershed

WATERSHED: Shell Lake and Upper Yellow River Watershed SC15							COUNTIES: Burnett, Washburn					Population:			
SQUARE MILES:							Assess ed M, E, U / miles	Class ^j	Use Impairment in Miles ^g Source / Contribution Stressor ^h / Contribution		Trend ^d / Miles	Com. ⁱ	Data Level ^k	Ref.	
Stream Name	WBID	Miles	Biol. Use/miles	Potential Biol. Use/miles	Integrit y Indicat or	Biological Use ³ Support/miles Other use/miles									
Yellow River	2670300	29	WWSF 29	WWSF	IBI=G	FULLY/29	M/1	DEF				R	H2, P2, B3		
Dahlstrom Brook	2678900	3	COLD I/3	COLD I/3		FULLY/3	M/3	ERW	BDAM,PSB	SED, TEMP		R	H1		
Sawyer Creek	2679000	7	COLD I/4 COLD II/3	COLD I/4 COLD II/3	IBI=P	PART	M/7	ORW	SB	FLOW,HAB		R	H2, P2, B3		
Whiskery Creek	2680400	3													
Dago Creek	2680600	1	COLD I/1	COLD I/1		THREATENED/1	U/1	ERW	BDAM	TEMP			H1		
Beaver Brook	2681700	7	COLD I/4 WWFF/3	COLD I/6 WWFF/1	IBI=G	FULLY	M/7	ORW	PSB	TEMP		R	H2, P2M B3		
Crystal Brook	2685500	4	COLD I/4	COLD I/4		FULLY/4	E/4	ERW							
Unnamed Creeks		29													
Thompson Creek							E		PSB	HAB,SED					

Streams of Upper Tamarack River Watershed

WATERSHED Upper Tamarack River Watershed SC16					COUNTIES: Burnett, Douglas		SQUARE MILES:		Population:				
Stream Name	WBID	Miles	Biol. Use/miles	Potential Biol. Use/miles	Integrity Indicator	Biological Use ³ Support/miles ----- Other use/miles	Assessed M, E, U / miles	Class ^j	Use Impairment in Miles ⁹ Source / Contribution Stressor ⁱ / Contribution	Trend ^d / Miles	Com. ⁱ	Data Level ^k	Ref.
St. Croix River	2601400	9	WWSF/9	WWSF/9		FULLY/9	M/9	ORW			R		
Upper Tamarack R.	2686200	31	WWFF/31	WWFF/31		FULLY/31	U/31	DEF			R		
Spruce River	2686500	22	WWFF/22	WWFF/22		FULLY/22	U/22	DEF			R		
Dingle Creek	2686700	6	WWFF/6	WWFF/6		FULLY/6	U/6	DEF					
Toad Creek	2687600	9	WWFF/9	WWFF/9		FULLY/9	U/9	DEF					
Chases Brook	2687800	27	WWFF	WWFF		FULLY/27	U/27	DEF			R		
Glendenning Cr.	2688100	3	LFF 3	COLD II LFF/2		FULLY/3	U/3	DEF	BDAM HAB, TEMP		R	H1	
Boyles Brook	2688300	3	COLD I/3	COLD I/3		FULLY/3	E/3	ERW			R		
Unnamed Creeks		19											

Streams of St. Croix & Moose Rivers Watershed

WATERSHED St. Croix & Moose Rivers Watershed SC17 MILES:					COUNTIES: Douglas, Burnett				SQUARE		Population:			
Stream Name	WBID	Mile s	Biol. Use/miles	Potential Biol. Use/miles	Integrity Indicator	Biological Use ³ Support/miles Other use/miles	Assesse d M, E, U / miles	Class ^j	Use Impairment in Miles ⁹ Source / Contribution Stressor ^h / Contribution	Trend ⁴ / Miles	Com. ⁱ	Data Level ^k	Ref.	
St. Croix River	2601400	23	WWSF/23	WWSF/23		FULLY	E/23	ORW			R			
Hay Creek	2688600	9	COLD I/9	COLD I/9		FULLY	E/9	ERW	PSB, SB		R	H1		
St. Croix R B N. Ch	2689100	2	WWSF/2	WWSF/2		FULLY		DEF						
Perkins Creek	2689400	7	COLD I/7	COLD I/7		FULLY	E/7	ERW			R	H1		
Moore Farm Cr.	2735800	2	COLD I/2	COLD I/2		FULLY	E/2	ERW	BDAM		R	H1		
Clemens Cr.	2735900	3	COLD I/2	COLD I/2		FULLY	E/3	ERW	BDAM			H1		
Rock Cr.	2736300	9	WWFF/9	WWFF/9		FULLY	U	DEF			R			
Thompson Cr.	2736400	9	WWFF/9	WWFF/9		FULLY	U	DEF			R			
Beaver Cr.	2736500	5	COLD II/2 WWFF/3	COLD II/2 WWFF/3		FULLY	U	DEF			R			
St. Croix R. B E Ch.	2736600	<1	WWSF<1	WWSF<1		FULLY	E<1	ORW						
Iron Cr.	2736700	1	LFF/1	LFF/1		FULLY	U	DEF						
Bacon Creek	2736800	2	COLD I/1	COLD I/1		FULLY	E/2	ERW						
Buckley Creek	2737100	4	COLD II/2 COLD III/3	COLD II/2 COLD III/2		FULLY	U	DEF			R			
Crotte Creek	2737900	13	WWFF/13	WWFF/13		FULLY	U	DEF			R			
Sheosh Creek	2738100	8	WWFF/8	WWFF/8		FULLY	U	DEF			R			
Potter Creek	2738400	2	COLD I/2	COLD I/2		FULLY	E/2	ERW						
Moose River	2738600	19	WWSF/6 WWFF/13	WWSF/6 WWFF/13		FULLY	U	DEF			R			
Arnold Creek	2738700	4	COLD I/4	COLD I/4		FULLY	E/4	ERW						
Buckety Creek	2738800	6	COLD II/2 COLD III/2 WWFF/2	COLD II/2 COLD III/2 WWFF/2		FULLY	U	DEF			R			
E.F. Moose River	2740000	4	WWFF/4	WWFF/4		FULLY	U	DEF						

Streams of Upper St. Croix & Eau Claire Rivers Watershed

COUNTIES: Bayfield, Douglas														Population:			
WATERSHED Upper St. Croix & Eau Claire Rivers Watershed SC18																	
SQUARE MILES:																	
Stream Name	WBID	Mile s	Biol. Use/miles	Potential Biol. Use/miles	Integrity Indicator	Biological Use ³ Support/miles	Assesse d M, E, U / miles	Class ^j	Use Impairment in Miles ⁹ Source / Contribution Stressor ^h / Contribution	Trend ⁴ / Miles	Com. ⁱ	Data Level ^k	Ref.				
St. Croix River	2601400	14	WWSP/14	WWSP/14		FULLY	M	ORW			R						
Spring Creek	2740400	3	COLD II/3	COLD II/3		FULLY	U	DEF									
Lord Creek	2740500	2	WWFF/2	WWFF/2		FULLY	U	DEF									
Carlson Creek	2740600	2	WWFF/2	WWFF/2		FULLY	U	DEF									
Eau Claire R.	2740700	21	COLD III/12 WWSF/4 WWFF/5	COLD III/12 WWSF/4 WWFF/5		FULLY	M	DEF			R						
Mulligan Creek	2742900	4	COLD III/4	COLD III/4		FULLY	U	DEF									
Lower Ox Creek	2744100	4	COLD II/1 COLD III/2 WWSF/1	COLD II/1 COLD III/2 WWSF/1		FULLY	U	DEF			R						
Upper Ox Creek	2744800	6	COLD II/6	COLD II/6		FULLY	U	DEF			R						
Mud Creek	2745500	3	COLD II/3	COLD II/3		FULLY	U	DEF			R						
Leo Creek	2747400	5	COLD I/2.5 COLD II/2.5	COLD II/2.5 COLD III/2.5		FULLY	U	DEF			R						
Park Creek	2747800	2	COLD II/1 COLD III/1	COLD II/1 COLD III/1		FULLY	U	DEF			R						
Beebe Creek	2748500	2	COLD I/2	COLD I/2		FULLY	E/2	ERW			R						
Catlin Creek	2748600	4	COLD I/3 COLD III/1	COLD I/3 COLD III/1		FULLY	E/4	ERW/3 DEF 1			R						
Porcupine Creek	2748700	3	LFF/3	LFF/3		FULLY	U	DEF									
St. Croix Creek	2749100	1	COLD I/1	COLD I/1		FULLY	E/1	ERW									
Unnamed Creeks		30															

Streams of Lower Namekagon River Watershed

WATERSHED - Lower Namekagon River Watershed SC19 MILES:						COUNTIES: Burnett, Washburn SQUARE			Population:				
Stream Name	WBID	Mile s	Biol. Use/miles	Potential Biol. Use/miles	Integrity Indicator	Biological Use ³ Support/miles <small>Source: Minnesota Pollution Control Agency</small>	Assesse d M, E, U / miles	Class ^j	Use Impairment in Miles ⁹ Source / Contribution Stressor ^h / Contribution	Trend ⁴ / Miles	Com. ⁱ	Data Level ^k	Ref.
Namekagon River	2689500	31	WWSF/31	WWSF/31		F/31	M	ORW			R		
Dogtown Creek	2689600	2	COLD I/2	COLD I/2		F/2	M2	ERW					
Totagatic River	2689800	17	WWSF/17	WWSF/17		F/17	U	DEF			R		
Barrens Brook	2689900	1	WWFF/1	WWFF/1		F/1	U	DEF					
Fivemile Creek	2690600	5	COLD II/5	COLD II/5		PART	M	ERW	BDAM	HAB, TEMP	R	H1	
Chicog Creek	2692100	13	WWFF/13	WWFF/13		F/13	U	DEF					
Little Chicog Cr.	2692300	3	LFF/3	LFF/3		F/3	U	DEF					
Webb Creek	2705100	8	WWFF/8	WWFF/8		F/8	U	DEF			R		
Nelson Creek	2705500	2	COLD I/2	COLD I/2		F/2	E/2	ERW					
McKenzie Creek	2706200	18	WWFF/18	WWFF/18	IBI=P	F/18	M/1/4	DEF			R	H2, P2, B3	
Rocky Ridge Cr.	2707400	3	WWFF/3	WWFF/3		F/3	U	DEF					
Casey Creek	2708600	16	WWFF/16	WWFF/16		F/16	U	DEF			R		
Christensen Cr.	2710400	1	COLD I/1	COLD I/1		F/1	E/1	ERW					
Stuntz Brook	2710500	18	COLD II/13 WWFF/5	COLD II/13 WWFF/5		F/18	U	DEF	BDAM	HAB, TEMP	R	H1	
McKenzie Creek	2711300	2	COLD I/2	COLD I/2		F/2	E/2	ERW	B DAM	HAB, TEMP		H1	
Boyle Brook	2711600	1	COLD III/1	COLD III/1									
Unnamed Creeks		31											

Streams of Totagatic River Watershed

WATERSHED - Totagatic River Watershed SC20										COUNTIES: Bayfield, Douglas, Sawyer, Washburn					Population:			
SQUARE MILES:																		
Stream Name	WBID	Miles	Biol. Use/miles	Potential Biol. Use/miles	Integrity Indicator	Biological Use ³ Support/miles <small>Use of the stream for biological purposes</small> Other use/miles	Assessed M, E, U / miles	Class ^j	Use Impairment in Miles ⁹ Source / Contribution Stressor ^h / Contribution	Trend ⁴ / Miles	Com. ⁱ	Data Level ^k	Ref.					
Totagatic River	2689800	63	WWSF/63	WWSF/63		F	U	DEF			R							
Cranberry Creek	2693200	1	COLD I/1	COLD I/1		U	E/1	ERW										
Bergen Creek	2694300	8	COLD II/3 COLD III/5	COLD II/3 COLD III/5		F	U	DEF			R							
Shell Creek	2695900	8	COLD I/2 WWFF/6	COLD I/2 WWFF/6		F	E/8	ORW/2 DEF/6			R							
Frog Creek	2697200	21	COLD II/1 WWFF/20	COLD II/1 WWFF/20		F	U	DEF			R							
Little Frog Creek	2697300	8	WWFF/8	WWFF/8		F	U	DEF			R							
Sink Creek	2697400	5	WWFF/5	WWFF/5		F	U	DEF										
Black Brook	2698200	5	WWFF/5	WWFF/5		F	U	DEF										
Cedar Creek	2698400	4	WWFF/4	WWFF/4		F	U	DEF										
Ounce River	2699500	27	COLD III/23 WWFF/4	COLD III/11 WWFF/4	IBI=P	F	M/1/4	DEF			R	H2, P2, B3						
Snake Creek	2699600	7	WWFF/7	WWFF/7		F	U	DEF			R							
Otter Creek	2701600	4	LFF/4	LFF/4		F	U	DEF										
O'Hara Creek	2702500	2	LFF/4	LFF/4		F	U	DEF										
Cole Creek	2702600	7	WWFF/4	WWFF/4		F	U	DEF			R							
Haymaker Creek	2702700	3	LFF/4	LFF/4		F	U	DEF										
Williamson Cr.	2703100	4	LFF/4	LFF/4		F	U	DEF										
Cold Brook	2703700	3	WWFF/3	WWFF/3		F	U	DEF										
Tag Alder Creek	2704500	4	WWFF/4	WWFF/4		F	U	DEF										
W. Fk Totagatic R.	2704800	3	WWFF/3	WWFF/3		F	U	DEF										
Hills Mill Creek	2704900	3	COLD III/3	COLD III/3		F	U	DEF										
Unnamed Creeks		55				UNK	U											

Streams of Trego Lake and Middle Namekagon River Watershed

WATERSHED: Trego Lake and Middle Namekagon River Watershed SC21 COUNTRIES: Sawyer, Washburn										Population:					
SQUARE MILES:															
Stream Name	WBID	Mile s	Biol. Use/miles		Potential Biol. Use/miles	Integrit y Indicat or	Biological Use ³ Support/miles ----- Other use/miles	Assesse d M, E, U / miles	Class ¹	Use Impairment in Miles ⁹ Source / Contribution Stressor ^h / Contribution		Trend ⁴ / Miles	Com. ¹	Data Level ^k	Ref.
Namekagon River	2689500	34						E/34	ORW				R		
Potato Creek	2712200	16	COLD III/2 WWFF/14	COLD III/2 WWFF/14		PART		U/16	DEF	PSB	HAB		R		
Little Mackay Cr.	2712300	2	COLD II/2	COLD II/2		PART		M/2	DEF	CM	TOX		R		
Pine Brook	2713300	1	COLD II/1	COLD II/1		F		U/1	DEF	PSB	HAB		R		
Westenberg Creek	2713800	1	COLD III/1	COLD III/1		PART		U/1	DEF	PSB,BY	BAC,HAB		R		
Dugan Run	2714100	2	WWFF/2	WWFF/2		FULLY		U/2	DEF						
Veazie Creek	2714800	2	WWSP/2	WWSP/2		FULLY		U/2	DEF						
Whalen Creek	2715800	5	COLD I/1 WWFF/4	COLD I/1 WWFF/4		PT		E/5	ERW/1 DEF 4	BDAM	HAB		R	H1	
Earl Creek	2716100	<1	COLD II/1	COLD II/1		FULLY		U/1	DEF						
Bean Brook	2716300	19	WWFF/4 COLD I/2 COLD II/13	WWFF/4 COLD I/2 COLD II/13		F		E/19	ERW 2 DEF 17				R		
Mackay Creek	2716400	8	COLD II/7 WWFF/1	COLD II/7 WWFF/1		T		U/8	DEF	BDAM	HAB		R	H2	
S. Fk. Bean Brook	2717400	2	COLD I/2	COLD I/2		F		E/2	ORW				R		
Godfrey Creek	2717500 0	8	COLD I/3 COLD II/5	COLD I/3 COLD II/5		F		E/8	ERW/3 DEF/5	PSB	HAB		R		
Little Bean Brook	2718300	4	COLD I/2 WWFF/2	COLD I/2 WWFF/2		F		E/4	ERW/2 DEF/2				R		
Gull Creek	2718900	9	COLD I/1 WWFF/8	COLD I/1 WWFF/8		F		E/9	ERW/1 DEF/8				R		
Spring Creek	2719500	8	COLD II/8	COLD II/8		T			DEF	BDAM	HAB,TEMP		R	H2	
Spring Brook	2720500	2	COLD I/2	COLD I/2		F		E/2	ERW						
Hay Creek	2720700	13	WWFF/13	WWFF/13		F			DEF				R		

WATERSHED Trego Lake and Middle Namekagon River Watershed SC21 COUNTIES: Sawyer, Washburn										Population:			
SQUARE MILES:													
Stream Name	WBID	Mile s	Biol. Potential Biol. Use/miles Use/miles		Integrit y Indicat or	Biological Use ³ Support/miles ----- Other use/miles	Assesse d M, E, U / miles	Class ^j	Use Impairment in Miles ⁹ Source / Contribution Stressor ^h / Contribution	Trend ⁴ / Miles	Com. ⁱ	Data Level ^k	Ref.
Tranus Creek	2721400	2	WWFF/2	WWFF/2		F		DEF					
Chippanazie Cr.	2721700	11	COLD I/.5 WWFF/10.5	COLD I/0.5 WWFF/10.5		F	E/11	ERW DEF			R		
Maggie Creek	2721800	2	WWFF/2	WWFF/2		F		DEF					
Elm Creek	2722900	5	WWFF/5	WWFF/5		F		DEF					
Flat Creek	2723900	2	WWFF/2	WWFF/2		F		DEF					
Rainbow Creek	2724300	1	COLD II/1	COLD		F		DEF			R		
Spring Lake Cr.	2724400	7	WWFF/7	WWFF/7		F		DEF			R		
Wheeler Brook	2724700	1	WWFF/1	WWFF/1		F		DEF					
Bradley Brook	2725300	<1	LAL	LAL		F	E	LAL			R		
Unnamed Creeks		54											

Streams of Upper Namekagon River Watershed

WATERSHED Upper Namekagon River Watershed SC22										COUNTIES: Bayfield, Sawyer			SQUARE		Population:									
MILES:																								
Stream Name	WBID	Mile s	Biol. Use/miles		Potential Biol. Use/miles	Integrity Indicator	Biological Use ³ Support/miles	Assesse d M, E, U / miles	Class ^l	Use Impairment in Miles ⁹ Source / Contribution Stressor ^h / Contribution	Trend ⁴ / Miles	Com. ⁱ	Data Level ^k	Ref.										
Namekagon River	2689500	33	COLD II/21	COLD II/21	WWSF/12		T	E/33	ORW			R												
Smith Lake Creek	2725600	4	WWFF	WWFF	WWFF		F		DEF			R												
Hatchery Creek	2726500	2	COLD I/2	COLD I/2	COLD I/2		F	E/2	ERW			R												
Mosquito Brook	2727000	4	COLD I/4	COLD I/4	COLD I/4		F	E/4	ORW			R												
McDermott Brook	2728200	2	COLD I/2	COLD I/2	COLD I/2		F	E/2	ORW			R												
Big Brook	2729100	8	COLD I/8	COLD I/8	COLD I/8		F	E/8	ORW															
Fondeau Creek	2729300	2	WWFF/2	WWFF/2	WWFF/2		F		DEF															
Little Brook	2730200	2	COLD I/2	COLD I/2	COLD I/2		F	E/2	ERW															
Spring Creek	2731400	3	COLD I/3				T	E/3	ERW				H2											
Cap Creek	2731600	9	COLD I/9				T	E/9	ERW	BDAM		R	H2											
Fivemile Creek	2731900	3	COLD I/3				T	E/3	ERW	BDAM			H2											
Taylor Creek	2733300	3	WWFF/3	WWFF/3	WWFF/3		F		DEF															
Jackson Creek	2734300	3					U																	
Castle Creek	2735600	5	COLD II/5	COLD II/5	COLD II/5		T		DEF	BDAM		R	H2											
Unnamed Creeks		38																						

Appendix F. Outstanding Resource Waters (ORW) and Exceptional Resource Waters (ERW) Located Within the St. Croix Basin

<u>Barron County</u>	<u>Portion Classified</u>	<u>Status</u>
Sand Lake	All	ORW

<u>Bayfield County</u>	<u>Portion Classified</u>	<u>Status</u>
Big Brook	All	ORW
Middle Eau Claire Lake	All	ORW
Namekagon Lake	All	ORW
Namekagon River	From Namekagon Lake outlet to Sawyer Co.	ORW
Owen Lake	All	ORW

<u>Burnett County</u>	<u>Portion Classified</u>	<u>Status</u>
St. Croix River	All	ORW
Namekagon River	All	ORW
North Fork Clam River	Headwaters to CTH H	ORW
South Fork Clam River	All	ORW
Indian Creek	All	ORW
Krantz Creek	All	ORW
Spencer Creek	All	ORW
Spring Brook	All	ORW
Big McKenzie Lake	All	ORW
Big Sand Lake	All	ORW
Sand Lake	All	ORW
(T40N – R15W – Sec. 25)		
Bear Brook	All	ERW
Benson Brook	All	ERW
Brant Brook	All	ERW
Clemeng Creek	All	ERW
Dody Brook	Clam R. Flowage to town road	ERW
Dogtown Creek	All	ERW
East Brook	All	ERW
Ekdall Brook	All	ERW
Hay Creek	T42N-R15W-SE Sec. 11 to St. Croix River	ERW
Jones Creek	All	ERW
Kettle Brook	All	ERW
Montgomery Creek	Upstream from CTH H	ERW
Moore Farm Creek	All	ERW
Nelson Creek	All	ERW
Perkins Creek	All	ERW
Pine Brook	All	ERW
Rand Creek	All	ERW

Sand Creek	Outlet to T37N-R14W-Sec. 18	ERW
Spring Brook (Spring Cr. & Spg)	All	ERW
Unnamed trib. to Hay Creek	All	ERW
(T42N – R15W – Sec. 13,14)		
<u>Douglas County</u>	<u>Portion Classified</u>	<u>Status</u>
Bardon Lake (Whitefish)	All	ORW
Bond Lake	All	ORW
Lower Eau Claire Lake	All	ORW
St. Croix River	From St. Croix flowage to Burnett Co. line	ORW
Upper St. Croix Lake	All	ORW
Arnold Creek	All	ORW
Bacon Creek	All	ORW
Rock Creek	Town road middle T47N-R14W-Sec.20 upstream to headwaters	ORW
<u>Polk County</u>	<u>Portion Classified</u>	<u>Status</u>
Clam River	West edge T36N-R15W-Sec. 8 downstream	ORW
McKenzie Creek	Downstream from 0.5 mi below McKenzie Lake	ORW
Orr Creek	Lower 1.0 mi of stream in T37N-R15W-Sec.13	ORW
Pipe Lake	All	ORW
Sand Creek & tributaries	All	ORW
St. Croix River	All, except portion from north boundary of St. Croix Falls city limits to one mile below the STH 243 bridge at Osceola	ORW
Behning Creek	All	ERW
Big Rock Creek	All	ERW
Burns Creek	All	ERW
Knapp Creek	Middle T37N-R16W-Sec. 17 to Knapp Flowage	ERW
Little McKenzie Creek	All	ERW
Marquee Creek & springs	All	ERW
Peabody Creek	Lower 1.0 mile	ERW
St. Croix River	From the north boundary of St. Croix Falls city limits to one mile below the STH 243 bridge at Osceola	ERW
Toby Creek & springs	All	ERW
Wolf Creek	CTH G downstream 1.2 miles	ERW
<u>Sawyer County</u>	<u>Portion Classified</u>	<u>Status</u>
Hayward Lake	All	ORW
Namekagon River	All	ORW
Nelson Lake	All	ORW
Pacwawong Lake	All	ORW
Phipps Lake	All	ORW
Bean Brook	All	ERW

<u>St. Croix County</u>	<u>Portion Classified</u>	<u>Status</u>
Bass Lake (T30N-R19W-Sec. 23)	All	ORW
Kinnickinnic River	Above STH 35	ORW
Perch Lake	All	ORW
St. Croix River	Between north boundary of Hudson city limits and Polk Co. border	ORW
Apple River	From Xcel plan below CTH I to mouth	ERW
Parker Creek	Lower 0.4	ERW
St. Croix River	From north boundary of Hudson city limits to Pierce Co. border	ERW
Willow River	From end of Class II portion into delta in Lake Mallalieu	ERW
<u>Washburn County</u>	<u>Portion Classified</u>	<u>Status</u>
Bass Lake (T40N-R10W-Sec. 17)	All	ORW
Beaver Brook	All	ORW
Middle McKenzie Lake	All	ORW
Namekagon River	All	ORW
S. Fork Bean Brook	All	ORW
Sawyer Creek	All	ORW
Shell Lake	All	ORW
Stone Lake (T39N-R10W-Sec. 24)	All	ORW
Trego Lake	All	ORW
Chippanazie Creek tributary (T41N0R10W-Sec. 9 to Sec. 16)	All	ERW
Chippanazie Creek	From Chippanazie Lake to county line	ERW
Crystal Brook	All	ERW
Dahlstrom Brook	All	ERW
Godfrey Creek	From T39N-R10W NE ¼ NE ¼ Sec. 9 To S. Fork Bean River	ERW
Gull Creek	All above Gull Lake	ERW
Little Bean Brook	All	ERW
McKenzie Creek	All	ERW
Namekagon R. tributary (T41N-R13W-Sec. 18)	All	ERW
Shell Creek	From CTH I upstream to springs in T42N-R12W-NE ¼ SE ¼ Sec. 22	ERW
Spring Brook	All	ERW
Whalen Creek	1.1 miles above Whalen Lake	ERW
Yellow River tributary (T38N-R13W-Sec. 4)	All	ERW
Yellow River tributary (T39N-R12W-Sec. 31)	All	ERW

Appendix G. Permitted Wastewater Treatment Facilities located

in the St. Croix Basin

Name	County	Type	Permit No.	Receiving Water
Advanced Food Products L.L.C.	Polk	Industrial	0039781	Groundwater, and Clear Lake through an unnamed pond tributary
Amani Sanitary District, Osceola	Polk	Municipal	0031861	Unnamed ditch leading to a wetland tributary to Horse Creek
Amery Wastewater Treatment Facility	Polk	Municipal	0020125	Apple River
Arcand Poultry Farm	Polk	Agricultural	0059366	Groundwater
Baldwin Dairy	St. Croix	Agricultural	0059102	Groundwater
Balsam Lake Wastewater Treatment Facility	Polk	Municipal	0020648	Groundwater
Burnett Dairy Cooperative, Alpha	Burnett	Industrial	0039039	Groundwater, tributary to the Wood River and the Wood River
Centuria Wastewater Treatment Facility	Polk	Municipal	0060283	Groundwater
Chiquita Processed Foods	St. Croix	Industrial	0002836	Willow River and the Groundwater
Clayton Wastewater Treatment Facility	Polk	Municipal	0036706	Intermittent tributary to Beaver Brook
Clear Lake Wastewater Treatment Facility	Polk	Municipal	0023639	Unnamed tributary to the Willow River
Cushing Sanitary District	Polk	Municipal	0058904	Groundwater
Deer Park Wastewater Treatment Facility	St. Croix	Municipal	0025356	Willow River
Emerald & Glenwood Sanitary District	St. Croix	Municipal	0031607	Groundwater
Emerald Dairy	St. Croix	Agricultural	0059315	Groundwater
F&A Dairy Products Inc.	Polk	Industrial	0054852	Groundwater
Forest Sanitary District	St. Croix	Municipal	0060747	Groundwater
Frederic Wastewater Treatment Facility	Polk	Municipal	0029254	Groundwater
Grantsburg Wastewater Treatment Facility	Burnett	Municipal	0060429	Wood River
Hammond Wastewater Treatment Facility	St. Croix	Municipal	0024171	Groundwater

Hayward Wastewater Treatment Facility	Sawyer	Municipal	0021121 Groundwater
Hudson Wastewater Treatment Facility	St. Croix	Municipal	0024279 St. Croix River
Jennie-O Turkey Store, Inc. - New Richmond Farm	St. Croix	Agricultural	0056499 Groundwater
Lake Wapogasset Bear Trap Lake Sanitary District	Polk	Municipal	0060313 Groundwater
Luck Wastewater Treatment Facility	Polk	Municipal	0021482 Groundwater and an unnamed wetland
Milltown Wastewater Treatment Facility	Polk	Municipal	0024741 Groundwater
Minglewood Inc., Deer Park	Polk	Agricultural	0059358 Groundwater
Minong Wastewater Treatment Facility	Washburn	Municipal	0035929 Groundwater
New Richmond Wastewater Treatment Facility	St. Croix	Municipal	0021245 Willow River
Nor Lake	St. Croix	Industrial	0057843 Groundwater
Osceola Wastewater Treatment Facility	Polk	Municipal	0025020 St. Croix River
Richmond Sanitary District	St. Croix	Municipal	0061069 Groundwater
River Falls Wastewater Treatment Facility	Pierce	Municipal	0029394 Kinnickinnic River
Roberts Wastewater Treatment Facility	St. Croix	Municipal	0028835 East Basin of Twin Lakes
Schottler Family Farm	St. Croix	Agricultural	0058289 Groundwater
Shell Lake Wastewater Treatment Facility	Washburn	Municipal	0020095 Groundwater
Siren Wastewater Treatment Facility	Burnett	Municipal	0028924 Groundwater and an unnamed wetland
Solon Springs Wastewater Treatment Facility	Douglas	Municipal	0061115 Groundwater
Somerset Wastewater Treatment Facility	St. Croix	Municipal	0030252 Apple River
Spooner Wastewater Treatment Facility	Washburn	Municipal	0021067 Groundwater

St. Croix Falls Wastewater Treatment Facility	St. Croix	Municipal	0020796 St. Croix River
St. Croix Meadows, Inc.	St. Croix	Industrial	0035980 Groundwater
St. Croix Tribal Fisheries	Burnett	Industrial	0057894 Loon Creek/St. Croix River
Star Prairie Wastewater Treatment Facility	St. Croix	Municipal	0060984 Apple River
Stone Lake Wastewater Treatment Facility	Washburn	Municipal	0060925 Groundwater
Telemark Lodge, Cable	Bayfield	Municipal	0060640 Groundwater
Twin City West Auto/Truck Plaza	St. Croix	Municipal	0060585 Groundwater
Ulrich Farms North, Inc., Dresser	Polk	Agricultural	0058939 Groundwater
USEPA Pentawood Superfund Site	Burnett	USEPA Site	none Groundwater
Webster Wastewater Treatment Facility	Burnett	Municipal	0028843 Drainage ditch tributary to the Clam River
WI DNR - Price Rite Remediation Project	Sawyer	Industrial	0048607 Namekagon River and the Groundwater
WI DNR Gov. Tommy Thompson Fish Hatchery, Spooner	Washburn	Industrial	0049191 Yellow River
WI DNR Osceola Fish Hatchery, Osceola	Polk	Industrial	0004197 Unnamed tributary to the St. Croix
WI DNR St. Croix Falls Fish Hatchery, St. Croix Falls	Polk	Industrial	0004201 St. Croix River

Appendix H. St. Croix Basin Wastewater Discharge Maps

Appendix I. 303(d) Waterbodies within the St. Croix Basin

Water Body Name	County	Water Body Code	Stream Mile	Total Mile	W/S	Impact
Cedar Lake	Polk, St. Croix	2615100			SC04	pH, nut, turbidity sed, chl a
Dunham Lake	Burnett	2651800			SC11	Hg FA
Echo Lake	Barron	2630200			SC07	Hg FA
Gilmore Lake	Washburn	2695800			SC20	Hg FA
Johnson Lake t40 r16w s23	Burnett	2471600			SC14	Hg FA
Loon Lake	Barron	2478600			SC07	Hg FA
Minong Flowage	Douglas				SC20	Hg FA
Minong Flowage	Washburn	2692900			SC20	Hg FA
Mud Hen Lake	Burnett	2649500			SC11	Hg FA
North Lake	Barron	2630800			SC06	Hg FA
North Sand Lake t40 r15w s25	Burnett	2495100			SC14	Hg FA
Red Lake	Douglas	2492100			SC20	Hg FA
Round Lake t37 r18w s27	Burnett	2640100			SC10	Hg FA
Scott Lake t35 r14w s16	Barron	2630700			SC06	Hg FA
Silver Lake	Washburn	2496900			SC19	Hg FA
Spring Lake t40 r11w s25	Washburn	2498600			SC21	Hg FA
Squaw Lake	St. Croix, Pierce	2499000			SC08	pH , nut, turbidity
St Croix Flowage	Douglas	2740300			SC18	Hg FA
Twin Lake	St Croix	2462300			SC01	pH, eutrophication
Ward Lake	Polk	2599400			SC11	Hg FA
Willow River	St. Croix	2606900	13.5-15		1.5 SC02	d.o.
Yellow Lake	Burnett	2675200			SC14	Hg FA

KEY:

Hg FA = Mercury fish advisory

DO = dissolved oxygen

pH = acidity

Chl a = chlorophyll A

Appendix J. Resource References

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